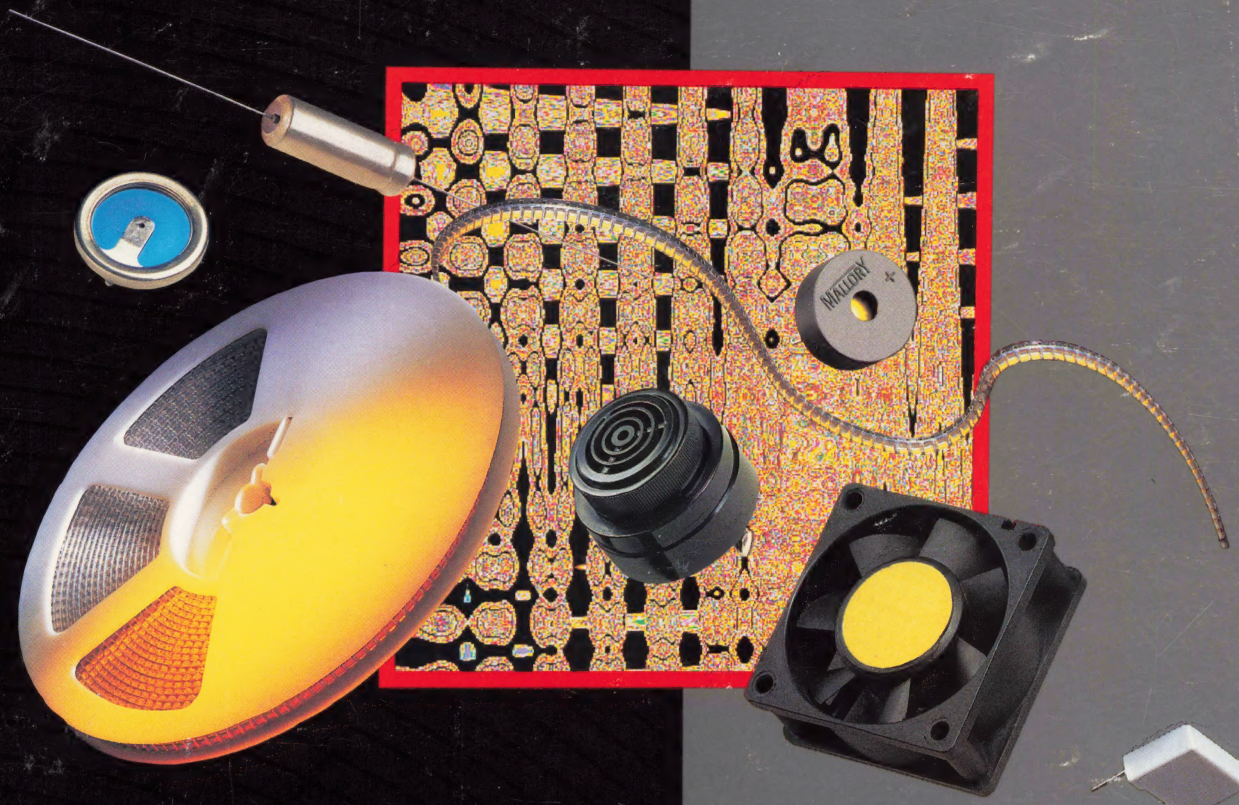
Electronic Components Catalog



MALLORY®

NORTH AMERICAN CAPACITOR COMPANY

To deliver competitive products and services that meet or exceed customer expectations, North American Capacitor Company pursues ongoing programs for advancement. This is achieved through a system of identifying, controlling, documenting, and continuously improving critical elements throughout all operations.

ISO9002 registration of NACC's Indianapolis and Greencastle, IN facilities was obtained in 1994.

INTRODUCTION

This General Catalog presents the vast array of capacitors, audible signal devices and other electronic components that are manufactured and distributed by North American Capacitor Company. In addition to the General Catalog, NACC has detailed technical bulletins available for some of the products. Over the life of this catalog, NACC cannot guarantee availability of individual parts, and in limited cases, line item minimums may be required.
For pricing, please request resale pricing from any of our Authorized Sales Representatives or Distributors.

Table of Contents

» Indicates New Product Offering In This Catalog

Table of Contents (continued)

Indicates New Product Offering In This Catalog

Product Index

» Indicates New Product Offering In This Catalog

Product Index (continued)

» Indicates New Product Offering In This Catalog

Index
Wet Tantalum Capacitors

MALLORY

Commercial Types

Type	Features	Capacitance Range	Voltage Range (VDC)	Temperature Range	Tolerances (%)	Case Dimensions (Inches)	Page Number
Elastomer Seal							
MTP	Max CV per Unit Volume Low DCL Low DF Silver Case	3.3 µF to 470 µF	6 to 60	-55°C +85°C	±10 ±20	(D x L) .115 x .300 to .225 x .778	3
MTPH	Max CV per Unit Volume Low DCL Low DF Silver Case 100% Burn-In	4.7 µF to 470 µF	6 to 60	-55°C +85°C	±10 ±20	(D x L) .115 x .403 to .225 x .778	4
TLS	Standard Range Silver Case Low DCL Low ESR	1.7 µF to 1200 µF	6 to 125	-55°C +125°C	±10 ±20 ±5 (Special Order)	(D x L) .188 x .453 to .375 x 1.062	5
TLH	Extended Range Silver Case Low DCL Low ESR	6.8 µF to 2200 µF	6 to 125	-55°C +125°C	±10 ±20 ±5 (Special Order)	(D x L) .188 x .453 to .375 x 1.062	7
Glass to Metal Seal							
TLW	Silver Case Low DCL Low ESR Commercial CLR65	1.7 µF to 1200 µF	6 to 125	-55°C +175°C (With proper derating)	±10 ±20 ±5 (Special Order)	(D x L) .188 x .453 to .375 x 1.062	9
XTH **XTK** **XTL** **XTM** **XTV**	High Capacitance High Voltage High Reliability	2 µF to 2200 µF	8 to 900	-55°C +175°C (With proper derating)	-15 +50% (Others Available)	(D x L) .656 x .438 to 1.125 x 2.810	11
All Tantalum - Glass to Metal Seal							
THT	Reverse Voltage 200°C Operation High Ripple Capability Low DCL Low ESR	1.7 µF to 1200 µF	6 to 125	-55°C +200°C (With proper derating)	±5 ±10 ±20	(D x H) .188 x .453 to .375 x 1.062	16
THX	Extended Range 175°C Operation High Ripple Capability Low DCL Low ESR	6.8 µF to 2200 µF	6 to 125	-55°C +175°C (With proper derating)	±10 ±20	(D x H) .188 x .453 to .375 x 1.062	18
NEW **THD/ TXTE**	Higher C/V Rating per Case Size vs Standard CLR 81 Series	10 µF to 1600 µF	25 to 125	-55°C +175°C (With proper derating)	±10 ±20	(D x H) .188 x .453 to .375 x 1.062	20
NEW **TNP**	Non-Polar Operation Low DCL Low ESR Long Life	3 µF to 410 µF	6 **VNP** to 100 **VNP**	-55°C +125°C (With proper derating)	±10 ±20	(D x L) .219 x .608 to .406 x 1.217	21
TBS	Stud or Pin Mounting 100% Burn-In Commercial MIL-C-83500 Custom Designs Available	47 µF to 1500 µF	6 to 125	-55°C+150°C (With proper derating)	±10 ±20	(D x H) .853 x .320	22
Modules							
W14	High Capacitance Reverse Voltage Constituent Units of TBS Design	94 µF to 7500 µF	6 to 125	-55°C +125°C (With proper derating)	±10 ±20	2.000 x 2.000 .460 Thick Molded Package	23
TMX	Long Life High Capacitance Reverse Voltage Constituent Units of CLR81 Design Low DCL	25 µF to 39,600 µF	6 to 200	-55°C +125°C (With proper derating)	±10 ±20	12 Package Sizes	24

MALLORY

Military - Established Reliability

MIL Specification	Commercial Equivalent	MIL QPL Approvals Failure Rate Levels	Features	Capacitance Range	Voltage Range (VDC)	Temperature Range	Tolerances (%)	Case Dimensions (Inches)	Page Number
M3965/21 CL55	TL	Not Applicable	Hermetically Sealed Rugged Construction Low DCL Low ESR	70 μF to 2400 μF	6 to 125	-55°C +125°C (With proper derating)	±10 ±20 ±5 (special)	5 Package Sizes	27
M3965/4 CL65	TLS	Not Applicable	Elastomer Seal Silver Case Rugged Construction Low DCL Low ESR	1.7 μF to 560 μF	6 to 125	-55°C +125°C (With proper derating)	±10 ±20 ±5 (special)	(D x L) .219 x .608 to .406 x .921	28
M83500/01 CRL01 CRL02 CRL03	TBS	Not Applicable	All Tant Construction 3 Volts Reverse 100% Burn-In Stud or Pin Mounting	47 μF to 1200 μF	6 to 125	-55°C +125°C (With proper derating)	±10 ±20	(D x L) .853 x .320	22
M39006/18 CLR10	XT	L, M, P	High Temperature High Voltage Hermetically Sealed Rugged Construction Long Shelf Life	2 μF to 140 μF	8 to 360	-55°C +125°C (With proper derating)	-15% +50%	(D x L) .656 x .438 to 1.781	30
M39006/19 CLR14	XT	L, M, P	High Temperature High Voltage Hermetically Sealed Rugged Construction Long Shelf Life	3.5 μF to 200 μF	20 to 630	-55°C +125°C (With proper derating)	-15% +75%	(D x L) .875 x .540 to 4.062	31
M39006/20 CLR17	XT	L, M, P	High Temperature High Voltage Hermetically Sealed Rugged Construction Long Shelf Life	12 μF to 1300 μF	30 to 630	-55°C +125°C (With proper derating)	±20% -15% +50%	(D x L) 1.125 x .600 to 2.810	32
M39006/09 CLR65	TLX	M, P, R	Silver Case Hermetic Seal Low DCL Low DF Long Life	1.7 μF to 1200 μF	6 to 125	-55°C +125°C (With proper derating)	±10 ±20 ±5 (special)	(D x L) .219 x .608 to .406 x 1.217	34
M39006/21 CLR69	TXX	M, P, R	Silver Case Hermetic Seal Low DCL Low DF Long Life	6.8μ F to 2200 μF	6 to 126	-55°C +125°C (With proper derating)	±10 ±20	(D x L) .219 x .608 to .406 x 1.217	37
M39006/22 CLR79	TLT	M, P , R	Tantalum Case 3 Volts Reverse Low DCL Low DF High Ripple Capability	1.7 μF to 1200 μF	6 to 125	-55°C +125°C (With proper derating)	±10 ±20 ±5 (special)	(D x L) .219 x .608 to .406 x 1.217	39
M39006/25 CLR81	TXT	M, P, R	Tantalum Case 3 Volts Reverse Extended Range Low DCL Low DF	6.8 μF to 2200 μF	6 to 125	-55°C +125°C (With proper derating)	±10 ±20	(D x L) .219 x .608 to .406 x 1.217	42
M39006/30 CLR90	TLF	M, P, R	Tantalum Case 3 Volts Reverse Low DCL Low DF **Lower ESR than CLR79**	1.7 μF to 1200 μF	6 to 125	-55°C +125°C (With proper derating)	±10 ±20 ±5 (special)	(D x L) .219 x .608 to .406 x 1.217	44
M39006/31 CLR91	TXF	M, P, R	Tantalum Case 3 Volts Reverse Extended Range Low DCL Low DF **Lower ESR than CLR81**	6.8 μF to 2200 μF	6 to 125	-55°C +125°C (With proper derating)	±10 ±20	(D x L) .219 x .608 to .406 x 1.217	47

Type MTP
Wet Tantalum Capacitors

MALLORY

- Maximum CV / Unit Volume
- Ruggedized Construction
- Low Dissipation Factor
- Low DC Leakage
- 100% 25°C DCL Screening
- 100% Voltage Age @ 85°C - 8 Hours
- 100 % Cap & DF Screening
- Monthly Lot Conformance
- Reliability: 2.0%/1000 Hrs.

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +85°C

Voltage Range:
6 to 60 VDC

Reverse Voltage:
None

Capacitance Range:
3.3 μF to 470 μF

Tolerance Range:
±10%, ±20%

DC Leakage:
At +25°C - 2.0 μA max
At +85°C - 6.0 to 10.0 μA max

Max RMS Ripple Current @ 85°C:

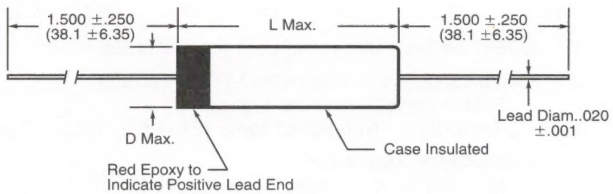
Case Code:	D	A	B	C
Milliamps:	7.5	12.5	50	140

Case Sizes: (Four)
.115 x .300 to .225 x .778

Some Typical Applications

Timing Circuits
Filter Coupling
Energy Storage
By-Pass Circuits

Physical Specifications



CASE	D INCHES(mm)	L INCHES(mm)	APPROX WT GRAMS
D	.115 (2.92)	.300 (7.62)	0.40
A	.115 (2.92)	.403 (10.23)	0.50
B	.145 (3.68)	.600 (15.24)	1.00
C	.225 (5.72)	.778 (19.76)	2.60

(1 Gram = .035 oz.)

Part Number Nomenclature

MTP	156	K	006	P	1	D
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. MTP Series - Sub-miniature
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits:Significant Figures
   Third digit: Number of zeros (Example: 156 = 15 μF)
3. Capacitance Tolerance:
   M = ±20%, K = ±10%
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. P = Polar
6. 1 = Mylar Sleeve
7. Case Size Code

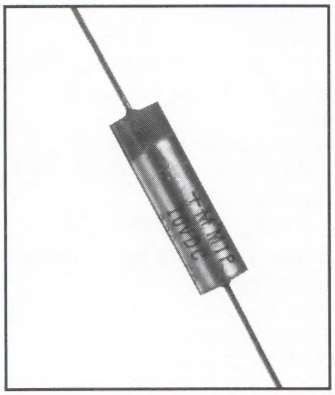
Cap (μF)	Volts DC	Case Size	Catalog Number	Max DCL μA +25°C	Max DCL μA +85°C	Max ESR Ω +25°C	Max Z Ω -55°C	Max %ΔC from +25°C -55°C	Max %ΔC from +25°C +85°C
15	6	D	MTP156*006P1D	2.0	6.0	15.9	300	-40	+15
47	6	A	MTP476*006P1A	2.0	6.0	9.6	85	-60	+15
150	6	B	MTP157*006P1B	2.0	8.0	3.9	35	-50	+15
180	6	B	MTP187*006P1B	2.0	8.0	3.4	32	-50	+15
450	6	C	MTP457*006P1C	2.0	10.0	1.9	25	-60	+15
470	6	C	MTP477*006P1C	2.0	10.0	1.8	23	-60	+15
10	10	D	MTP106*010P1D	2.0	6.0	18.6	380	-40	+15
33	10	A	MTP336*010P1A	2.0	6.0	11.3	100	-40	+15
100	10	B	MTP107*010P1B	2.0	8.0	4.0	46	-45	+15
120	10	B	MTP127*010P1B	2.0	8.0	3.5	42	-50	+15
300	10	C	MTP307*010P1C	2.0	10.0	1.8	31	-60	+15
330	10	C	MTP337*010P1C	2.0	10.0	1.6	31	-60	+15
22	15	A	MTP226*015P1A	2.0	6	12.1	120	-40	+12
68	15	B	MTP686*015P1B	2.0	8.0	6.2	58	-45	+12
80	15	B	MTP806*015P1B	2.0	8.0	5.3	50	-45	+12
200	15	C	MTP207*015P1C	2.0	10.0	2.0	37	-50	+12
220	15	C	MTP227*015P1C	2.0	10.0	1.8	36	-50	+12
6.8	20	D	MTP685*020P1D	2.0	6.0	27.3	445	-35	+11
15	20	A	MTP156*020P1A	2.0	6.0	17.7	150	-40	+11
47	20	B	MTP476*020P1B	2.0	8.0	6.8	73	-40	+11
60	20	B	MTP606*020P1B	2.0	8.0	7.1	60	-45	+11
150	20	C	MTP157*020P1C	2.0	10.0	2.7	38	-50	+11

Cap (μF)	Volts DC	Case Size	Catalog Number	Max DCL μA +25°C	Max DCL μA +85°C	Max ESR Ω +25°C	Max Z Ω -55°C	Max %ΔC from +25°C -55°C	Max %ΔC from +25°C +85°C
6	30	D	MTP605*030P1D	2.0	6.0	30.9	459	-40	+10
10	30	A	MTP106*030P1A	2.0	6.0	21.2	200	-35	+10
45	30	B	MTP456*030P1B	2.0	8.0	7.1	80	-35	+10
120	30	C	MTP127*030P1C	2.0	10.0	3.3	42	-45	+10
4.7	35	D	MTP475*035P1D	2.0	6.0	39.5	570	-30	+10
10	35	A	MTP106*035P1A	2.0	6.0	21.2	240	-35	+10
100	35	C	MTP107*035P1C	2.0	10.0	4.0	48	-45	+10
4	50	D	MTP405*050P1D	2.0	6.0	39.8	600	-30	+10
6.8	50	A	MTP685*050P1A	2.0	6.0	31.2	310	-30	+10
30	50	B	MTP306*050P1B	2.0	8.0	9.7	120	-30	+10
33	50	B	MTP336*050P1B	2.0	8.0	8.8	120	-30	+10
68	50	C	MTP686*050P1C	2.0	10.0	4.3	54	-40	+10
78	50	C	MTP786*050P1C	2.0	10.0	3.7	52	-40	+10
3.3	60	D	MTP335*060P1D	2.0	6.0	48.2	680	-25	+9
4.7	60	A	MTP475*060P1A	2.0	6.0	39.5	400	-30	+9
6.8	60	A	MTP685*060P1A	2.0	6.0	31.2	367	-30	+9
10	60	B	MTP106*060P1B	2.0	8.0	23.9	217	-35	+9
15	60	B	MTP156*060P1B	2.0	8.0	17.7	174	-35	+9
22	60	B	MTP226*060P1B	2.0	8.0	14.5	140	-30	+9
33	60	C	MTP336*060P1C	2.0	10.0	7.2	75	-35	+9
47	60	C	MTP476*060P1C	2.0	10.0	5.6	62	-40	+9
68	60	C	MTP686*060P1C	2.0	10.0	4.3	51	-40	+9

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%

Type MTPH
Wet Tantalum Capacitors

MALLORY



- Maximum CV / Unit Volume
- Ruggedized Construction
- Very Low Dissipation Factor
- Very Low DC Leakage
- 100% "Hot" 85°C DCL Screening
- 100% Voltage Age @ 85°C - 48 Hours
- Quality Assurance Testing on Each Production Lot to MIL-STD-202
- Accelerated Life: .65%/AQL
- Recorded Available Test Data
- Reliability: 0.1%/1000 Hrs.

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +85°C

Voltage Range:
6 to 60VDC

Reverse Voltage:
None

Capacitance Range:
4.7 μF to 470 μF

Tolerance Range:
±10%, ±20%

DC Leakage:
At +25°C - 2.0 μA max
At +85°C - 6.0 to 10.0 μA max

Max RMS Ripple Current @ 85°C:

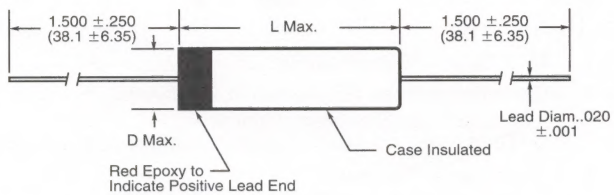
Case Code:	A	B	C
Milliamps:	12.5	50	140

Case Sizes: (Three)
.115 x .403 to .225 x .778

Some Typical Applications

Timing Circuits
Filter Coupling
Energy Storage
By-Pass Circuits

Physical Specifications



CASE	D INCHES(mm)	L INCHES(mm)	APPROX WT GRAMS
A	.115 (2.92)	.403 (10.23)	0.50
B	.145 (3.68)	.600 (15.24)	1.00
C	.225 (5.72)	.778 (19.76)	2.60

(1 Gram = .035 oz.)

Part Number Nomenclature

MTPH	156	K	006	P	1	D
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. MTPH Series - Sub-miniature/High Reliability
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits:Significant Figures
   Third digit: Number of zeros (Example: 156 = 15 μF)
3. Capacitance Tolerance:
   M = ±20%, K = ±10%
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. P = Polar
6. 1 = Mylar Sleeve
7. Case Size Code

Cap (μF)	Volts DC	Case Size	Catalog Number	Max DCL μA +25°C	Max DCL μA +85°C	Max ESR Ω +25°C	Max Z Ω -55°C	Max %ΔC from +25°C -55°C	Max %ΔC from +25°C +85°C
47	6	A	MTPH476*006P1A	2.0	6.0	9.6	85	-60	+15
150	6	B	MTPH157*006P1B	2.0	8.0	3.9	35	-50	+15
180	6	B	MTPH187*006P1B	2.0	8.0	3.4	32	-50	+15
450	6	C	MTPH457*006P1C	2.0	10.0	1.9	25	-60	+15
470	6	C	MTPH477*006P1C	2.0	10.0	1.8	23	-60	+15
33	10	A	MTPH336*010P1A	2.0	6.0	11.3	100	-40	+15
100	10	B	MTPH107*010P1B	2.0	8.0	4.0	46	-45	+15
120	10	B	MTPH127*010P1B	2.0	8.0	3.5	42	-50	+15
300	10	C	MTPH307*010P1C	2.0	10.0	1.8	31	-60	+15
330	10	C	MTPH337*010P1C	2.0	10.0	1.6	31	-60	+15
22	15	A	MTPH226*015P1A	2.0	6	12.1	120	-40	+12
68	15	B	MTPH686*015P1B	2.0	8.0	6.2	58	-45	+12
80	15	B	MTPH806*015P1B	2.0	8.0	5.3	50	-45	+12
200	15	C	MTPH207*015P1C	2.0	10.0	2.0	37	-50	+12
220	15	C	MTPH227*015P1C	2.0	10.0	1.8	36	-50	+12
15	20	A	MTPH156*020P1A	2.0	6.0	17.7	150	-40	+11
47	20	B	MTPH476*020P1B	2.0	8.0	6.8	73	-40	+11
60	20	B	MTPH606*020P1B	2.0	8.0	7.1	60	-45	+11
150	20	C	MTPH157*020P1C	2.0	10.0	2.7	38	-50	+11

Cap (μF)	Volts DC	Case Size	Catalog Number	Max DCL μA +25°C	Max DCL μA +85°C	Max ESR Ω +25°C	Max Z Ω -55°C	Max %ΔC from +25°C -55°C	Max %ΔC from +25°C +85°C
10	30	A	MTPH106*030P1A	2.0	6.0	21.2	200	-35	+10
45	30	B	MTPH456*030P1B	2.0	8.0	7.1	80	-35	+10
120	30	C	MTPH127*030P1C	2.0	10.0	3.3	42	-45	+10
10	35	A	MTPH106*035P1A	2.0	6.0	21.2	240	-35	+10
100	35	C	MTPH107*035P1C	2.0	10.0	4.0	48	-45	+10
6.8	50	A	MTPH685*050P1A	2.0	6.0	31.2	310	-30	+10
30	50	B	MTPH306*050P1B	2.0	8.0	9.7	120	-30	+10
33	50	B	MTPH336*050P1B	2.0	8.0	8.8	120	-30	+10
68	50	C	MTPH686*050P1C	2.0	10.0	4.3	54	-40	+10
78	50	C	MTPH786*050P1C	2.0	10.0	3.7	52	-40	+10
4.7	60	A	MTPH475*060P1A	2.0	6.0	39.5	400	-30	+9
6.8	60	A	MTPH685*060P1A	2.0	6.0	31.2	367	-30	+9
10	60	B	MTPH106*060P1B	2.0	8.0	23.9	217	-35	+9
15	60	B	MTPH156*060P1B	2.0	8.0	17.7	174	-35	+9
22	60	B	MTPH226*060P1B	2.0	8.0	14.5	140	-30	+9
33	60	C	MTPH336*060P1C	2.0	10.0	7.2	75	-35	+9
47	60	C	MTPH476*060P1C	2.0	10.0	5.6	62	-40	+9
68	60	C	MTPH686*060P1C	2.0	10.0	4.3	51	-40	+9

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type TLS
Wet Tantalum Capacitors

MALLORY

- Silver Case Technology
- High Capacitance per Case Size
- Extremely Low DCL
- Long Operating Life
- Rugged Mechanical Construction
- Wide Operating Temperature Range

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C

Voltage Range:
6 to 125 VDC @ 85°C
4 to 85 VDC @ 125°C

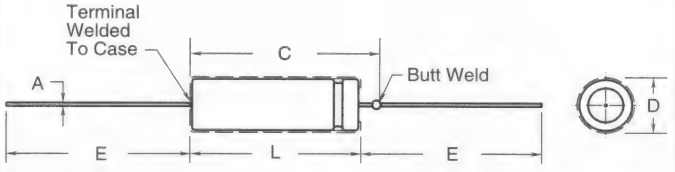
Capacitance:
1.7 to 1200 μF

Tolerance Range:
±20%, ±10%
(±5% on special order)

TYPICAL APPLICATIONS

Filtering, coupling, bypass circuits
Critical timing circuits
Low source impedance circuits
High charging current circuits

Physical Specifications



Part Number Nomenclature

TLS	405	K	060	C	1	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. TLS Series - Silver Case/Standard Capacitance Ratings
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits:Significant Figures
   Third digit: Number of zeros (Example: 405 = 4μF)
3. Capacitance Tolerance:
   M = ±20%, K = ±10%, J = ±5%
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. C = Temp Range
6. 1 = Mylar Sleeve
7. Case Size Code

DIMENSIONS

Case MIL	INCHES Uninsulated D ±.016	Uninsulated L +.031, -.016	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)	Case MIL	MILLIMETERS Uninsulated D ±.41	Uninsulated L +.79, -.41	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±6.35
A T1	.188	.453	.219	.608	.734	.025	#22	1.500	1.4	A T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
B T2	.281	.641	.312	.796	.922	.025	#22	2.250	3.0	B T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
C T3	.375	.766	.406	.921	1.047	.025	#22	2.250	5.6	C T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
F T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	9.2	F T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

6 WVDC; 7 VDC Surge @ 85°C
4 WVDC; 4.7 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max ESR Ω + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
30	A	TLS306*006C1A	1	2	4.0	100	-40	+10.5	+12
68	A	TLS686*006C1A	1	2	4.0	60	-40	+14	+16
140	B	TLS147*006C1B	1	3	2.0	40	-40	+14	+16
270	B	TLS277*006C1B	1	6.5	4.0	25	-44	+17.5	+20
330	C	TLS337*006C1C	2	7.9	2.0	20	-44	+14	+16
560	C	TLS567*006C1C	2	13	3.0	25	-64	+17.5	+20
1200	F	TLS128*006C1F	3	14	1.6	20	-80	+25	+25

8 WVDC; 9.2 VDC Surge @ 85°C
5 WVDC; 5.7 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max ESR Ω + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
25	A	TLS256*008C1A	1	2	4.0	100	40	+10.5	+12
56	A	TLS566*008C1A	1	2	4.0	59	-40	+14	+16
220	B	TLS227*008C1B	1	7	4.0	30	-44	+17.5	+20
430	C	TLS437*008C1C	2	14	2.8	25	-64	+17.5	+20
850	F	TLS857*008C1F	4	16	1.0	22	-80	+25	+25

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%, J = ±5%

10 WVDC; 11.5 VDC Surge @ 85°C
7 WVDC; 8 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max ESR Ω + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
20	A	TLS206*010C1A	1	2	4.0	175	-32	+10.5	+12
47	A	TLS476*010C1A	1	2	5.1	100	-36	+14	+16
100	B	TLS107*010C1B	1	4	2.0	60	-36	+14	+16
180	B	TLS187*010C1B	1	7	4.0	40	-36	+14	+16
250	C	TLS257*010C1C	2	10	2.0	30	-40	+14	+16
390	C	TLS397*010C1C	2	16	3.0	25	-64	+17.5	+20
750	F	TLS757*010C1F	4	16	1.0	23	-80	+25	+25

15 WVDC; 17.2 VDC Surge @ 85°C
10 WVDC; 11.5 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max ESR Ω + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
15	A	TLS156*015C1A	1	2	5.0	155	-24	+10.5	+12
33	A	TLS336*015C1A	1	2	5.0	90	-28	+14	+16
70	B	TLS706*015C1B	1	4	2.5	75	-28	+14	+16
120	B	TLS127*015C1B	1	7	4.1	50	-28	+17.5	+20
170	C	TLS177*015C1C	2	10	2.0	35	-32	+14	+16
270	C	TLS277*015C1C	2	16	3.0	30	-56	+17.5	+20
540	F	TLS547*015C1F	6	24	1.2	23	-80	+25	+25

Type TLS
Wet Tantalum Capacitors

MALLORY

Cap µF	Case Code	Catalog Number	Max DCL µA 25°C	Max DCL µA 85°C/125°C	Max ESR Ω + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	Max % Cap Change From 25°C +85°C	Max % Cap Change From 25°C +125°C
25 WVDC; 28.8 VDC Surge @ 85°C 15 WVDC;17.2 VDC Surge @ 125°C									
10	A	TLS106*025C1A	1	2	6.1	220	-16	+ 8	+ 9
22	A	TLS226*025C1A	1	2	5.0	140	-20	+10.5	+12
100	B	TLS107*025C1B	1	10	4.2	50	-28	+13	+15
180	C	TLS187*025C1C	2	18	4.0	32	-48	+13	+15
350	F	TLS357*025C1F	7	28	1.3	24	-70	+25	+25
30 WVDC; 34.5 VDC Surge @ 85°C 20 WVDC; 23 VDC Surge @ 125°C									
8	A	TLS805*030C1A	1	2	7.5	275	-16	+ 8	+12
15	A	TLS156*030C1A	1	2	8.0	175	-20	+10.5	+12
40	B	TLS406*030C1B	1	5	4.0	65	-24	+10.5	+12
68	B	TLS686*030C1B	1	8	6.0	60	-24	+13	+15
100	C	TLS107*030C1C	2	12	2.5	40	-28	+10.5	+12
150	C	TLS157*030C1C	2	18	4.1	35	-48	+13	+15
300	F	TLS307*030C1F	8	32	1.5	25	-60	+25	+25
50 WVDC; 57.5 VDC Surge @ 85°C 30 WVDC; 34.5 VDC Surge @ 125°C									
5	A	TLS505*050C1A	1	2	9.0	400	-16	+ 5	+ 6
10	A	TLS106*050C1A	1	2	8.0	250	-24	+ 8	+ 9
25	B	TLS256*050C1B	1	5	5.9	95	-20	+10.5	+12
47	B	TLS476*050C1B	1	9	6.0	70	-28	+13	+15
60	C	TLS606*050C1C	2	12	3.0	45	-16	+10.5	+12
82	C	TLS826*050C1C	2	16	4.0	45	-32	+13	+15
160	F	TLS167*050C1F	8	32	2.1	27	-50	+25	+25
60 WVDC; 69 VDC Surge @ 85°C 40 WVDC; 46 VDC Surge @ 125°C									
4	A	TLS405*060C1A	1	2	9.9	550	-16	+ 5	+ 6
8.2	A	TLS825*060C1A	1	2	8.1	275	-24	+ 8	+ 9
20	B	TLS206*060C1B	1	5	5.0	105	-16	+10.5	+12
39	B	TLS396*060C1B	1	9	7.0	90	-28	+10.5	+12
50	C	TLS506*060C1C	2	12	4.1	50	-16	+10.5	+12
68	C	TLS686*060C1C	2	16	6.0	50	-32	+10.5	+12
140	F	TLS147*060C1F	8	32	2.4	28	-40	+20	+20
75 WVDC; 86.2 VDC Surge @ 85°C 50 WVDC; 57.5 VDC Surge @ 125°C									
3.5	A	TLS355*075C1A	1	2	9.5	650	-16	+ 5	+ 6
6.8	A	TLS685*075C1A	1	2	8.0	300	-20	+ 8	+ 9
15	B	TLS156*075C1B	1	5	6.6	150	-16	+ 8	+ 9
33	B	TLS336*075C1B	1	10	7.0	90	-24	+10.5	+15
40	C	TLS406*075C1C	2	12	5.0	60	-16	+10.5	+12
56	C	TLS566*075C1C	2	17	6.2	60	-28	+10.5	+15
110	F	TLS117*075C1F	9	36	3.1	29	-35	+20	+20
100 WVDC; 115 VDC Surge @ 85°C 65 WVDC; 74.8 VDC Surge @ 125°C									
2.5	A	TLS255*100C1A	1	2	26.5	950	-16	+ 7	+ 8
4.7	A	TLS475*100C1A	1	2	10.2	500	-16	+ 7	+ 8
11	B	TLS116*100C1B	1	4	6.0	200	-16	+ 7	+ 8
22	B	TLS226*100C1B	1	9	7.1	100	-16	+ 7	+ 8
30	C	TLS306*100C1C	2	12	4.0	80	-16	+ 7	+ 8
43	C	TLS436*100C1C	2	17	6.1	70	-20	+ 7	+ 8
86	F	TLS866*100C1F	9	36	3.2	30	-25	+15	+15
125 WVDC; 144 VDC Surge @ 85°C 85 WVDC; 97.8 VDC Surge @ 125°C									
1.7	A	TLS175*125C1A	1	2	54.6	1250	-16	+ 7	+ 8
3.6	A	TLS365*125C1A	1	2	15.1	600	-16	+ 7	+ 8
9	B	TLS905*125C1B	1	5	15.0	240	-16	+ 7	+ 8
14	B	TLS146*125C1B	1	7	12.0	167	-16	+ 7	+ 8
18	C	TLS186*125C1C	2	9	11.1	129	-16	+ 7	+ 8
25	C	TLS256*125C1C	2	13	10.1	93	-16	+ 7	+ 8
56	F	TLS566*125C1F	10	40	4.1	32	-25	+15	+15

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%, J = ±5%

Type TLH
Wet Tantalum Capacitors

MALLORY

- Silver Case Technology
- Extended Capacitance Range
- Extremely Low DCL
- Long Operating Life
- Rugged Mechanical Construction
- Wide Operating Temperature Range

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C

Voltage Range:
6 to 125 VDC @ 85°C
4 to 85 VDC @ 125°C

Capacitance:
6.8 to 2200 μF

Tolerance Range:
±20%, ±10%
(±5% on special order)

TYPICAL APPLICATIONS

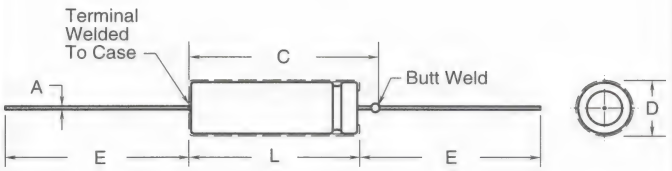
Filtering, coupling, bypass circuits

Critical timing circuits

Low source impedance circuits

High charging current circuits

Physical Specifications



Part Number Nomenclature

TLH	276	K	060	C	1	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. TLH Series - Silver Case/Extended Capacitance Ratings
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits:Significant Figures
   Third digit: Number of zeros (Example: 276 = 27μF)
3. Capacitance Tolerance:
   M = ±20%, K = ±10%, J = ±5%
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. C = Temp Range
6. 1 = Mylar Sleeve
7. Case Size Code

DIMENSIONS

Case MIL	INCHES Uninsulated D ±.016	Uninsulated L +.031, -.016	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)	Case MIL	MILLIMETERS Uninsulated D ±.41	Uninsulated L +.79, -.41	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±6.35
A T1	.188	.453	.219	.608	.734	.025	#22	1.500	1.4	A T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
B T2	.281	.641	.312	.796	.922	.025	#22	2.250	4.2	B T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
C T3	.375	.766	.406	.921	1.047	.025	#22	2.250	7.4	C T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
F T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	7.8	F T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

6 WVDC; 7 VDC Surge @ 85°C
4 WVDC; 4.7 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max ESR Ω + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
220	A	TLH227*006C1A	2	9	3.2	36	-64	+13	+21
820	B	TLH827*006C1B	3	14	2.5	18	-88	+16	+21
1500	C	TLH158*006C1C	5	20	1.5	18	-90	+20	+25
2200	F	TLH228*006C1F	6	24	1.1	13	-90	+25	+30

8 WVDC; 9.2 VDC Surge @ 85°C
5 WVDC; 5.7 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max ESR Ω + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
180	A	TLH187*008C1A	2	9	3.3	45	-60	+13	+20
680	B	TLH687*008C1B	3	14	2.2	22	-83	+16	+21
1500	C	TLH158*008C1C	5	20	1.5	18	-90	+20	+25
1800	F	TLH188*008C1F	7	25	1.0	14	-90	+25	+30

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%, J = ±5%

10 WVDC; 11.5 VDC Surge @ 85°C
7 WVDC; 8 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max ESR Ω + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
150	A	TLH157*010C1A	2	9	3.1	54	-55	+13	+20
560	B	TLH567*010C1B	3	16	2.4	27	-77	+16	+21
1200	C	TLH128*010C1C	5	20	1.5	18	-88	+20	+25
1500	F	TLH158*010C1F	7	25	1.0	15	-88	+25	+30

15 WVDC; 17.2 VDC Surge @ 85°C
10 WVDC; 11.5 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max ESR Ω + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
100	A	TLH107*015C1A	2	9	4.0	72	-44	+13	+16
390	B	TLH397*015C1B	3	16	2.4	31	-66	+16	+20
820	C	TLH827*015C1C	6	24	1.7	22	-77	+20	+25
1000	F	TLH108*015C1F	8	32	1.2	17	-77	+25	+30

Type TLH
Wet Tantalum Capacitors

MALLORY

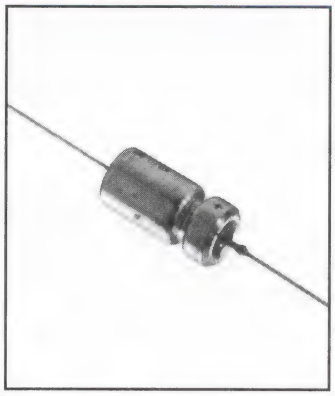
Cap µF	Case Code	Catalog Number	Max DCL µA 25°C	Max DCL µA 85°C/ 125°C	Max ESR Ω + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
25 WVDC; 28.8 VDC Surge @ 85°C 15 WVDC; 17.2 VDC Surge @ 125°C									
68	A	TLH686*025C1A	2	9	4.1	90	-40	+12	+16
270	B	TLH277*025C1B	3	16	2.6	33	-62	+13	+16
560	C	TLH567*025C1C	7	28	1.8	24	-72	+20	+25
680	F	TLH687*025C1F	8	32	1.2	19	-72	+25	+30
30 WVDC; 34.5 VDC Surge @ 85°C 20 WVDC; 23 VDC Surge @ 125°C									
56	A	TLH566*030C1A	2	9	5.0	100	-38	+12	+15
220	B	TLH227*030C1B	3	16	2.5	36	-60	+13	+16
470	C	TLH477*030C1C	8	32	1.9	25	-65	+20	+25
560	F	TLH567*030C1F	9	36	1.3	20	-65	+25	+30
50 WVDC; 57.5 VDC Surge @ 85°C 30 WVDC; 34.5 VDC Surge @ 125°C									
33	A	TLH336*050C1A	2	9	5.0	135	-29	+10	+12
120	B	TLH127*050C1B	4	24	2.5	49	-42	+12	+15
270	C	TLH277*050C1C	8	32	1.8	29	-46	+20	+25
330	F	TLH337*050C1F	9	36	1.2	22	-46	+25	+30
60 WVDC; 69 VDC Surge @ 85°C 40 WVDC; 46 VDC Surge @ 125°C									
27	A	TLH276*060C1A	3	12	5.0	144	-24	+10	+12
100	B	TLH107*060C1B	4	20	2.5	54	-36	+12	+15
220	C	TLH227*060C1C	8	32	1.8	29	-40	+16	+20
270	F	TLH277*060C1F	9	36	1.2	23	-45	+20	+25
75 WVDC; 86.2 VDC Surge @ 85°C 50 WVDC; 57.5 VDC Surge @ 125°C									
22	A	TLH226*075C1A	3	12	5.0	157	-19	+10	+12
82	B	TLH826*075C1B	4	24	2.3	63	-30	+12	+15
180	C	TLH187*075C1C	9	36	1.8	30	-35	+16	+20
220	F	TLH227*075C1F	10	40	2.2	24	-40	+20	+25
100 WVDC; VDC Surge @ 85°C 65 WVDC; VDC Surge @ 125°C									
10	A	TLH106*100C1A	3	12	6.0	200	-17	+10	+12
39	B	TLH396*100C1B	5	24	3.5	80	-20	+12	+15
68	C	TLH686*100C1C	10	40	2.2	40	-30	+14	+16
120	F	TLH127*100C1F	12	48	2.8	30	-35	+15	+17
125 WVDC; VDC Surge @ 85°C 85 WVDC; VDC Surge @ 125°C									
6.8	A	TLH685*125C1A	3	12	11.7	300	-14	+10	+12
27	B	TLH276*125C1B	5	24	3.5	90	-18	+12	+15
47	C	TLH476*125C1C	10	40	2.2	50	-26	+14	+16
82	F	TLH826*125C1F	12	48	2.8	32	-30	+15	+17

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%, J = ±5%

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type TLW
Wet Tantalum Capacitors

MALLORY



- 175°C Operation
- Silver Case Technology
- MIL-C-39006/09 Designs
- Hermetically Sealed
- Rugged Construction
- High Shock and Vibration Capability
- High Capacitance per Case Size
- Low DCL and ESR
- Long Shelf Life

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +175°C
with proper derating

Voltage Range:
6 to 125 VDC @ 85°C

Capacitance Range:
1.7 μF to 1200 μF

Tolerance Range:
±10%, ±20%
(±5% by special order)

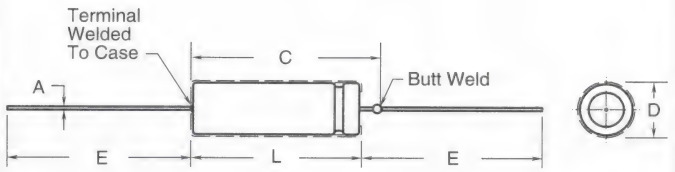
Case Sizes: (Four)
188 x.453 to .375 x 1.062

TYPICAL APPLICATIONS

Filtering, bypass circuits
Coupling and timing circuits
Low source impedance circuits
High charging current circuits

Maximum rms Ripple Current @ 85°C	
Case Code	mA
A	50
B	250
C	500
F	750

Physical Specifications



Part Number Nomenclature

TLW	107	K	010	P	6	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. TLW Series - Silver Case/High Temperature Capability
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits:Significant Figures
   Third digit: Number of zeros (Example: 107 = 100μF)
3. Capacitance Tolerance:
   M = ±20%, K = ±10%, J = ±5%
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. P = Polar
6. 6 = Kapton Sleeve
7. Case Size Code

DIMENSIONS

INCHES

Case MIL	Uninsulated D ±.016	Uninsulated L +.031, -.016	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)
T1	.188	.453	.219	.608	.734	.025	#22	1.500	2.7
T2	.281	.641	.312	.796	.922	.025	#22	2.250	6.5
T3	.375	.766	.406	.921	1.047	.025	#22	2.250	12.0
T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	18.0

MILLIMETERS

Case MIL	Uninsulated D ±.41	Uninsulated L +.79, -.41	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±6.35
T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

6 WVDC @ 85°C
4 WVDC @ 125°C; 3 WVDC @ 175°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 125°C	Max DCL μA 175°C	Max Z Ω -55°C	Max % Cap Change from 25°C 85°C	Max % Cap Change from 25°C 125°C
30	A	TLW306*006P6A	1.0	2.0	5.8	100	+10.5	+12
68	A	TLW686*006P6A	1.0	2.0	13.0	60	+14	+16
140	A	TLW147*006P6A	1.0	3.0	27.0	40	+14	+16
270	B	TLW277*006P6B	1.0	6.5	52.0	25	+17.5	+20
330	C	TLW337*006P6C	2.0	7.9	70.0	20	+14	+16
560	C	TLW567*006P6C	2.0	13.0	110.0	25	+17.5	+20
1000	C	TLW108*006P6C	3.0	14.0	200.0	20	+20	+20
1200	F	TLW128*006P6F	3.0	14.0	230.0	20	+25	+25

8 WVDC @ 85°C
5 WVDC @ 125°C; 4 WVDC @ 175°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 125°C	Max DCL μA 175°C	Max Z Ω -55°C	Max % Cap Change from 25°C 85°C	Max % Cap Change from 25°C 125°C
25	A	TLW256*008P6A	1.0	2.0	6.4	100	+10.5	+12
56	A	TLW566*008P6A	1.0	2.0	14.0	59	+14	+16
120	A	TLW127*008P6A	1.0	4.0	30.0	50	+14	+16
220	B	TLW227*008P6B	1.0	7.0	56.0	30	+17.5	+20
430	B	TLW437*008P6B	2.0	14.0	110.0	25	+17.5	+20
850	C	TLW857*008P6C	4.0	16.0	218.0	22	+25	+25
1000	F	TLW108*008P6F	4.0	16.0	250.0	16	+25	+25

10 WVDC @ 85°C
7 WVDC @ 125°C; 5 WVDC @ 175°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 125°C	Max DCL μA 175°C	Max Z Ω -55°C	Max % Cap Change from 25°C 85°C	Max % Cap Change from 25°C 125°C
20	A	TLW206*010P6A	1.0	2.0	6.4	175	+10.5	+12
39	A	TLW396*010P6A	1.0	2.0	12.0	80	+12	+15
47	A	TLW476*010P6A	1.0	2.0	15.0	100	+14	+16
82	A	TLW826*010P6A	1.0	2.0	26.0	70	+14	+16
100	A	TLW107*010P6A	1.0	4.0	32.0	60	+14	+16
180	B	TLW187*010P6B	1.0	7.0	58.0	40	+14	+16
250	B	TLW257*010P6B	2.0	10.0	80.0	30	+14	+16
390	B	TLW397*010P6B	2.0	16.0	120.0	25	+17.5	+20
600	C	TLW607*010P6C	5.0	16.0	150.0	20	+20	+25
680	F	TLW687*010P6F	4.0	16.0	175.0	18	+20	+25
750	C	TLW757*010P6C	4.0	16.0	210.0	23	+20	+25
820	F	TLW827*010P6F	4.0	16.0	240.0	17	+20	+25

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%, J = ±5%

Type TLW
Wet Tantalum Capacitors

MALLORY

Cap µF	Case Code	Catalog Number	Max DCL µA 25°C	Max DCL µA 125°C	Max DCL µA 175°C	Max Z Ω -55°C	Max % Cap Change from 25°C 85°C	Max % Cap Change from 25°C 125°C
15 WVDC @ 85°C 10 WVDC @ 125°C; 8 WVDC @ 175°C								
15	A	TLW156*015P6A	1.0	2.0	7.2	155	+10.5	+12
33	A	TLW336*015P6A	1.0	2.0	16.0	90	+14	+16
55	B	TLW556*015P6B	1.0	4.0	17.0	90	+14	+16
68	A	TLW686*015P6A	1.0	4.0	34.0	80	+14	+16
70	B	TLW706*015P6B	1.0	4.0	34.0	75	+14	+16
120	B	TLW127*015P6B	2.0	7.0	58.0	50	+17.5	+20
170	C	TLW177*015P6C	2.0	10.0	82.0	35	+14	+16
270	C	TLW277*015P6C	2.0	16.0	130.0	30	+17.5	+20
540	C	TLW547*015P6C	6.0	24.0	260.0	23	+20	+25
560	F	TLW567*015P6F	6.0	24.0	270.0	19	+20	+25
20 WVDC @ 85°C 13 WVDC @ 125°C; 10 WVDC @ 175°C								
27	A	TLW276*020P6A	1.0	2.0	25.0	100	+11	+14
56	A	TLW566*020P6A	2.0	9.0	55.0	90	+13	+16
100	B	TLW107*020P6B	1.0	7.0	96.0	50	+12	+15
170	B	TLW177*020P6B	2.0	16.0	150.0	35	+17.5	+20
220	B	TLW227*020P6B	3.0	16.0	220.0	35	+16	+20
390	C	TLW397*020P6C	6.0	24.0	350.0	25	+20	+25
470	F	TLW477*020P6F	6.0	24.0	450.0	20	+20	+25
25 WVDC @ 85°C 15 WVDC @ 125°C; 13 WVDC @ 175°C								
10	A	TLW106*025P6A	1.0	2.0	8.0	220	+8	+9
22	A	TLW226*025P6A	1.0	2.0	18.0	140	+10.5	+12
47	A	TLW476*025P6A	1.0	4.0	38.0	100	+14	+16
50	B	TLW506*025P6B	1.0	4.0	38.0	100	+14	+16
100	B	TLW107*025P6B	1.0	10.0	80.0	50	+13	+15
180	B	TLW187*025P6B	2.0	18.0	140.0	32	+13	+15
350	C	TLW357*025P6C	7.0	28.0	280.0	24	+25	+25
390	F	TLW397*025P6F	7.0	28.0	312.0	21	+25	+25
30 WVDC @ 85°C 20 WVDC @ 125°C; 15 WVDC @ 175°C								
18	A	TLW186*030P6A	1.0	2.0	8.0	130	+10.5	+20
39	A	TLW396*030P6A	1.0	5.0	37.0	110	+16	+20
40	B	TLW406*030P6B	1.0	5.0	38.0	65	+16	+20
68	B	TLW686*030P6B	1.0	8.0	65.0	60	+13	+20
100	C	TLW107*030P6C	2.0	12.0	96.0	40	+10.5	+20
150	C	TLW157*030P6C	2.0	18.0	140.0	35	+13	+20
300	C	TLW307*030P6C	8.0	32.0	290.0	25	+20	+20
330	F	TLW337*030P6F	8.0	32.0	320.0	40	+20	+20
35 WVDC @ 85°C 23 WVDC @ 125°C; 18 WVDC @ 175°C								
12	A	TLW126*035P6A	1.0	2.0	13.0	175	+10.5	+20
15	A	TLW156*035P6A	1.0	7.0	17.0	170	+10.5	+20
27	A	TLW276*035P6A	2.0	9.0	30.0	150	+10.5	+20
33	A	TLW336*035P6A	2.0	9.0	37.0	130	+12	+20
56	B	TLW566*035P6B	1.0	7.0	63.0	60	+12	+20
68	B	TLW686*035P6B	1.0	7.0	76.0	60	+13	+20
100	C	TLW107*035P6C	3.0	16.0	110.0	50	+10.5	+20
120	B	TLW127*035P6B	3.0	16.0	135.0	45	+11	+20
180	C	TLW187*035P6C	8.0	32.0	200.0	30	+20	+20
220	F	TLW227*035P6F	8.0	32.0	250.0	25	+20	+20
270	F	TLW277*035P6F	8.0	32.0	300.0	23	+20	+20

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%, J = ±5%

Cap µF	Case Code	Catalog Number	Max DCL µA 25°C	Max DCL µA 125°C	Max DCL µA 175°C	Max Z Ω -55°C	Max % Cap Change from 25°C 85°C	Max % Cap Change from 25°C 125°C
50 WVDC @ 85°C 30 WVDC @ 125°C; 25 WVDC @ 175°C								
10	A	TLW106*050P6A	1.0	2.0	16.0	250	+8	+20
22	A	TLW226*050P6A	1.0	5.0	35.0	200	+14	+20
25	B	TLW256*050P6B	1.0	5.0	40.0	95	+10.5	+20
47	B	TLW476*050P6B	1.0	9.0	75.0	70	+13	+20
82	C	TLW826*050P6C	2.0	16.0	130.0	45	+13	+20
160	C	TLW167*050P6C	8.0	32.0	260.0	27	+20	+20
180	F	TLW187*050P6F	8.0	32.0	260.0	25	+20	+20
60 WVDC @ 85°C 40 WVDC @ 125°C; 30 WVDC @ 175°C								
8.2	A	TLW825*060P6A	1.0	2.0	16.0	275	+8	+20
18	A	TLW186*060P6A	1.0	6.0	35.0	245	+12	+20
39	B	TLW396*060P6B	1.0	9.0	75.0	90	+10.5	+20
68	C	TLW686*060P6C	2.0	16.0	130.0	50	+10.5	+20
140	C	TLW147*060P6C	3.0	25.0	270.0	55	+16	+20
150	F	TLW157*060P6F	8.0	32.0	290.0	45	+16	+20
75 WVDC @ 85°C 50 WVDC @ 125°C; 38 WVDC @ 175°C								
5.6	A	TLW565*075P6A	1.0	2.0	14.0	320	+8	+20
6.8	A	TLW685*075P6A	1.0	2.0	16.0	300	+8	+20
12	A	TLW126*075P6A	1.0	5.0	28.0	200	+8	+20
15	B	TLW156*075P6B	1.0	5.0	36.0	175	+8	+20
27	B	TLW276*075P6B	1.0	10.0	52.0	95	+8	+20
33	B	TLW336*075P6B	1.0	10.0	79.0	75	+10.5	+20
47	B	TLW476*075P6B	2.0	16.0	115.0	60	+10.5	+20
56	B	TLW566*075P6B	2.0	17.0	130.0	55	+10.5	+20
82	C	TLW826*075P6C	9.0	36.0	200.0	50	+12	+20
100	F	TLW107*075P6F	9.0	36.0	240.0	35	+12	+20
110	C	TLW117*075P6C	9.0	36.0	260.0	33	+20	+20
120	F	TLW127*075P6F	3.0	25.0	290.0	27	+16	+20
100 WVDC @ 85°C 65 WVDC @ 125°C; 50 WVDC @ 175°C								
2.5	A	TLW255*100P6A	1.0	2.0	8.0	950	+7	+20
3.9	A	TLW395*100P6A	1.0	2.0	12.0	600	+7	+20
4.7	A	TLW475*100P6A	1.0	2.0	15.0	500	+7	+20
10	B	TLW106*100P6B	1.0	4.0	32.0	200	+7	+20
11	B	TLW116*100P6B	1.0	4.0	35.0	200	+7	+20
15	B	TLW156*100P6B	1.0	7.0	48.0	135	+7	+20
18	B	TLW186*100P6B	1.0	5.0	57.0	110	+7	+20
22	B	TLW226*100P6B	1.0	5.0	70.0	100	+7	+20
25	B	TLW256*100P6B	2.0	13.0	80.0	150	+8	+20
33	C	TLW336*100P6C	2.0	16.0	106.0	80	+7	+20
43	C	TLW436*100P6C	2.0	16.0	140.0	70	+7	+20
68	F	TLW686*100P6F	9.0	36.0	215.0	30	+15	+20
86	F	TLW866*100P6F	9.0	36.0	280.0	30	+15	+20
125 WVDC @ 85°C 85 WVDC @ 125°C; 62 WVDC @ 175°C								
1.7	A	TLW175*125P6A	1.0	2.0	7.0	1240	+7	+20
3.6	A	TLW365*125P6A	1.0	2.0	14.0	600	+7	+20
9.0	B	TLW905*125P6B	1.0	5.0	36.0	240	+7	+20
14	B	TLW146*125P6B	1.0	7.0	56.0	167	+7	+20
18	C	TLW186*125P6C	2.0	9.0	72.0	129	+7	+20
25	C	TLW256*125P6C	2.0	13.0	100.0	93	+7	+20
56	F	TLW566*125P6F	10.0	40.0	220.0	32	+15	+20

Types XTH - K - L - M - V
Wet Tantalum Capacitors

MALLORY

- High Temperature
- High Voltage
- High Capacitance
- Withstands High Frequency Vibration to 2000 Hz
- Hermetically Sealed
- Long Shelf Life

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +175°C
with proper derating

Voltage Range:
8 to 900 VDC @ 85°C

Reverse Voltage:
None

Capacitance Range:
2 μF to 2200 μF

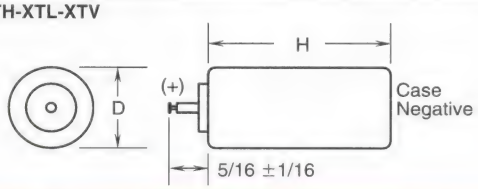
Tolerance Range:
-15 +50% (Standard for XTK, M, V)
-15 +75% (Standard for XTH, L)
±20% (Special order)

Case Sizes:

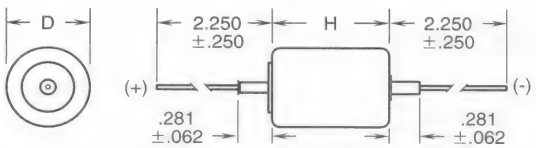
Type	D	H
XTK - XTM	.656	.438 to 1.781
XTL - XTH	.875	.540 to 4.062
XTV	1.125	.600 to 2.810

Note: Photo of XTH-L-V shown with optional solder lug (Configuration C) available as special order. Other configurations also available. See pages 14-15.

XTH-XTL-XTV



XTK - XTM



Capacitance (μF)	Maximum Working Voltage		Typical ESR	Maximum DCL @ Maximum WVDC in μA			Max Z 85°C	Maximum % Capacitance Change from Room Temperature			Approx Weight	Max Ripple 120 Hz RMS -55°C to +175°C	Size		Catalog Number
	+125°C	+175°C	(Ohms)	+85°C	+125°C	+175°C	(Ohms)	-55°C	+85°C	+175°C	(Grams)	(mA)	D +.031 -.015	H +.062 -.062	
8 WVDC @ 85°C															
70	7	5	10.0	30	45	60	60	-60	+30	+30	14	137	.656	.438	XTK706*008P0A
140	7	5	5.0	50	75	100	30	-60	+30	+30	15	213	.656	.562	XTM147*008P0A
10 WVDC @ 85°C															
50	8.5	7	10.0	25	37	50	75	-60	+30	+30	14	137	.656	.438	XTK506*010P0A
100	8.5	7	5.0	45	67	90	40	-60	+30	+30	15	213	.656	.562	XTM107*010P0A
12 WVDC @ 85°C															
580	10	8	1.5	135	197	270	20	-90	+20	+35	48	550	1.125	.600	XTV587*012P0A
850	10	8	1.5	135	197	270	20	-90	+20	+35	50	550	1.125	.600	XTV857*012P0A
1100	10	8	1.5	135	197	270	20	-90	+20	+35	60	694	1.125	1.100	XTV118*012P0A
2200	10	8	1.5	135	197	270	20	-90	+20	+35	82	694	1.125	1.100	XTV228*012P0A
18 WVDC @ 85°C															
35	15	12	10.0	30	45	60	85	-60	+30	+30	14	137	.656	.438	XTK356*018P0A
70	15	12	5.0	50	75	100	45	-60	+30	+30	15	213	.656	.562	XTM706*018P0A
120	15	12	2.8	50	75	100	30	-60	+15	+40	26	328	.875	.540	XTL127*018P0A
240	15	12	2.5	80	120	160	20	-60	+15	+40	32	390	.875	.732	XTH247*018P0A
390	15	12	1.5	165	227	330	20	-85	+20	+35	48	550	1.125	.600	XTV397*018P0A
560	15	12	1.5	165	227	330	20	-85	+20	+35	50	550	1.125	.600	XTV567*018P0A
900	15	12	1.5	165	227	330	20	-85	+20	+35	68	694	1.125	1.100	XTV907*018P0A
1800	15	12	1.5	165	227	330	20	-85	+20	+35	82	694	1.125	1.100	XTV188*018P0A
20 WVDC @ 85°C															
28	17.5	13	10.0	30	45	60	85	-60	+30	+30	14	137	.656	.438	XTK286*020P0A
56	17.5	13	5.0	50	75	100	45	-60	+30	+30	15	213	.656	.562	XTM566*020P0A
100	17.5	13	2.8	50	75	100	30	-60	+15	+40	26	328	.875	.540	XTL107*020P0A
200	17.5	13	2.5	80	120	160	20	-60	+15	+40	32	390	.875	.732	XTH207*020P0A
30 WVDC @ 85°C															
20	25	20	10.0	35	52	70	125	-40	+20	+20	14	137	.656	.438	XTK206*030P0A
40	25	20	5.0	60	90	120	75	-40	+20	+20	15	213	.656	.562	XTM406*030P0A
75	25	20	2.7	55	82	110	45	-45	+15	+30	26	333	.875	.540	XTL756*030P0A
150	25	20	2.7	90	135	180	30	-45	+15	+30	32	375	.875	.732	XTH157*030P0A
250	25	20	2.5	195	287	390	20	-65	+20	+35	48	427	1.125	.600	XTV257*030P0A
370	25	20	1.5	125	170	215	15	-65	+20	+35	50	550	1.125	.600	XTV377*030P0A
650	25	20	1.5	145	202	250	15	-85	+20	+35	68	694	1.125	1.100	XTV657*030P0A
1300	25	20	1.5	190	282	375	10	-85	+20	+35	82	694	1.125	1.100	XTV138*030P0A

*Insert Tolerance Code: T = -15+50% (Standard for XTK, XTM, XTV)
U = -15+75% (Standard for XTH, XTL)
M = ±20% (Available by Special Order)

Types XTH - K - L - M - V
Wet Tantalum Capacitors

MALLORY

Capacitance (µF)	Maximum Working Voltage +125°C	Maximum Working Voltage +175°C	Typical ESR (Ohms)	Maximum DCL @ Maximum WVDC in µA +85°C	+125°C	+175°C	Max Z 85°C (Ohms)	Maximum % Capacitance Change from Room Temperature -55°C	+85°C	+175°C	Approx Weight (Grams)	Max Ripple 120 Hz RMS -55°C to +175°C (mA)	Size D +.031 -.015	Size H +.062 -.062	Catalog Number
35 WVDC @ 85°C															
20	30	23	10.0	35	52	72	125	-40	+20	+20	14	137	.656	.438	XTK206*035P0A
40	30	23	5.0	60	90	120	75	-40	+20	+20	15	213	.656	.562	XTM406*035P0A
60	30	23	2.7	55	82	110	45	-45	+10	+30	26	333	.875	.540	XTL606*035P0A
40 WVDC @ 85°C															
190	34	27	2.5	195	297	400	20	-55	+20	+35	48	427	1.125	.600	XTV197*040P0A
290	34	27	2.5	200	300	400	20	-55	+20	+35	50	427	1.125	.600	XTV297*040P0A
500	34	27	1.5	200	300	400	20	-75	+20	+35	68	694	1.125	1.100	XTV507*040P0A
1000	34	27	1.5	195	297	400	20	-75	+20	+35	82	694	1.125	1.100	XTV108*040P0A
50 WVDC @ 85°C															
900	44	32	1.5	195	297	400	25	-85	+20	+35	82	694	1.125	1.100	XTV907*050P0A
60 WVDC @ 85°C															
12	50	40	10.0	35	52	70	180	-30	+20	+20	14	137	.656	.438	XTK126*060P0A
25	50	40	5.0	60	90	120	90	-30	+20	+20	15	213	.656	.562	XTM256*060P0A
40	50	40	2.7	60	90	120	65	-35	+10	+20	26	333	.875	.540	XTL406*060P0A
70	50	40	2.7	90	135	180	40	-35	+10	+20	32	375	.875	.732	XTH706*060P0A
80	50	40	2.7	95	142	190	35	-35	+10	+20	32	375	.875	.732	XTH806*060P0A
130	50	40	2.5	210	315	420	30	-50	+20	+35	48	427	1.125	.600	XTV137*060P0A
200	50	40	1.5	135	182	230	30	-50	+20	+35	50	550	1.125	.600	XTV207*060P0A
350	50	40	1.5	155	210	265	25	-70	+20	+35	68	694	1.125	1.100	XTV357*060P0A
700	50	40	1.5	200	275	350	15	-70	+20	+35	82	694	1.125	1.100	XTV707*060P0A
750	50	40	1.5	200	275	350	29	-70	+20	+35	82	694	1.125	1.100	XTV757*060P0A
90 WVDC @ 85°C															
8	80	60	10.0	35	52	70	250	-30	+20	+20	14	137	.656	.438	XTK805*090P0A
16	80	60	5.0	60	90	120	125	-30	+20	+20	15	213	.656	.562	XTM166*090P0A
25	80	60	2.7	55	82	110	90	-35	+10	+20	26	333	.875	.540	XTL256*090P0A
50	80	60	2.7	90	135	180	45	-35	+10	+20	32	375	.875	.732	XTH506*090P0A
84	80	60	2.5	195	287	390	40	-40	+20	+35	48	427	1.125	.600	XTV846*090P0A
120	80	60	1.5	135	182	230	40	-40	+20	+35	50	550	1.125	.600	XTV127*090P0A
220	80	60	1.5	145	202	250	30	-60	+20	+35	68	694	1.125	1.100	XTV227*090P0A
450	80	60	1.5	195	215	235	25	-60	+20	+35	82	694	1.125	1.100	XTV457*090P0A
180 WVDC @ 85°C															
2	160	120	20.0	75	112	150	850	-30	+20	+20	21	108	.656	.719	XTK205*180P0A
4	160	120	20.0	35	52	70	500	-30	+20	+20	21	117	.656	.719	XTK405*180P0A
8	160	120	10.0	60	90	120	250	-30	+20	+20	23	186	.656	.938	XTM805*180P0A
12	160	120	5.6	55	82	110	180	-35	+10	+20	44	282	.875	.920	XTL126*180P0A
25	160	120	5.3	90	135	180	90	-35	+10	+20	56	341	.875	1.300	XTH256*180P0A
42	160	120	5.0	120	162	205	75	-40	+20	+35	74	363	1.125	.976	XTV426*180P0A
60	160	120	3.0	135	182	230	60	-40	+20	+35	78	363	1.125	.976	XTV606*180P0A
110	160	120	3.0	145	202	250	60	-60	+20	+35	114	631	1.125	1.938	XTV117*180P0A
230	160	120	3.0	200	275	350	50	-60	+20	+35	142	631	1.125	1.938	XTV237*180P0A
270 WVDC @ 85°C															
2.5	240	180	30.0	35	52	70	750	-30	+20	+20	28	112	.656	1.031	XTK255*270P0A
5	240	180	15.0	55	82	110	375	-30	+20	+20	31	179	.656	1.375	XTM505*270P0A
8	240	180	8.3	55	82	110	270	-35	+10	+20	62	266	.875	1.270	XTL805*270P0A
16	240	180	8.3	90	135	180	135	-35	+10	+20	81	320	.875	1.865	XTH166*270P0A
28	240	180	7.5	120	162	205	80	-40	+20	+35	100	339	1.125	1.350	XTV286*270P0A
40	240	180	7.5	135	182	230	100	-40	+20	+35	104	339	1.125	1.350	XTV406*270P0A
75	240	180	4.5	145	202	250	90	-60	+20	+35	160	608	1.125	2.812	XTV756*270P0A
150	240	180	4.5	195	215	235	75	-60	+20	+35	202	608	1.125	2.812	XTV157*270P0A
360 WVDC @ 85°C															
2	320	240	40.0	35	52	70	1000	-30	+20	+20	37	108	.656	1.312	XTK205*360P0A
4	320	240	20.0	60	90	120	500	-30	+20	+20	41	175	.656	1.781	XTM405*360P0A
6	320	240	11.0	55	82	110	360	-35	+10	+20	80	258	.875	1.635	XTL605*360P0A
12	320	240	11.0	90	135	180	180	-35	+10	+20	105	314	.875	2.420	XTH126*360P0A
22	320	240	10.0	125	170	215	100	-40	+20	+35	126	323	1.125	1.705	XTV226*360P0A
30	320	240	10.0	135	182	230	120	-40	+20	+35	133	323	1.125	1.705	XTV306*360P0A

*Insert Tolerance Code: T = -15+50% (Standard for XTK, XTM, XTV)
U = -15+75% (Standard for XTH, XTL)
M = ±20% (Available by Special Order)

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Types XTH - K - L - M - V
Wet Tantalum Capacitors

MALLORY

Capacitance (μF)	Maximum Working Voltage		Typical ESR	Maximum DCL @ Maximum WVDC in μA			Max Z 85°C	Maximum % Capacitance Change from Room Temperature			Approx Weight	Max Ripple 120 Hz RMS -55°C to +175°C	Size		Catalog Number
	+125°C	+175°C	(Ohms)	+85°C	+125°C	+175°C	(Ohms)	-55°C	+85°C	+175°C	(Grams)	(mA)	D +.031 -.015	H +.062 -.062	
450 WVDC @ 85°C															
5	400	300	13.0	55	82	110	450	-35	+10	+20	98	262	.875	2.000	XTL505*450P0A
10	400	300	13.0	90	135	180	225	-35	+10	+20	130	318	.875	2.980	XTH106*450P0A
17	400	300	12.5	125	170	215	130	-40	+20	+35	152	315	1.125	2.080	XTV176*450P0A
25	400	300	12.5	135	182	230	150	-40	+20	+35	164	315	1.125	2.080	XTV256*450P0A
540 WVDC @ 85°C															
4	480	360	16.6	55	82	110	540	-35	+10	+20	114	250	.875	2.365	XTL405*540P0A
8	480	360	16.6	90	135	180	270	-35	+10	+20	154	306	.875	3.532	XTH805*540P0A
14	480	300	15.0	120	162	205	160	-40	+20	+35	178	309	1.125	2.435	XTV146*540P0A
20	480	300	15.0	135	182	230	170	-40	+20	+35	196	309	1.125	2.435	XTV206*540P0A
630 WVDC @ 85°C															
3.5	560	420	18.9	55	82	110	630	-35	+10	+20	133	249	.875	2.720	XTL355*630P0A
7	560	420	18.9	90	135	180	315	-35	+10	+20	179	308	.875	4.062	XTH705*630P0A
12	560	420	17.5	120	162	205	180	-40	+20	+35	204	306	1.125	2.810	XTV126T630P0A
18	560	420	17.5	135	182	230	200	-40	+20	+35	225	306	1.125	2.810	XTV186*630P0A
720 WVDC @ 85°C															
3.5	640	480	21.6	55	82	110	800	-20	+10	+20	153	246	.875	3.062	XTL355*720P0A
810 WVDC @ 85°C															
2.8	720	540	24.3	55	82	110	900	-20	+10	+20	170	245	.875	3.440	XTL285*810P0A
900 WVDC @ 85°C															
2.5	800	600	27.0	55	82	110	1000	-20	+10	+20	190	244	.875	3.795	XTL255*900P0A

*Insert Tolerance Code: T = -15+50% (Standard for XTK, XTM, XTV)
U = -15+75% (Standard for XTH, XTL)
M = ±20% (Available by Special Order)

Part Number Nomenclature

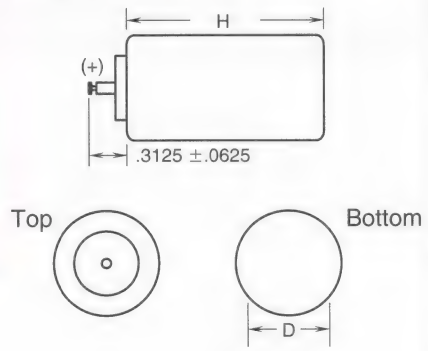
XTV	126	T	630	P	0	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. Series - (XTH, XTK, XTL, XTM, XTV)
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits:Significant Figures
   Third digit: Number of zeros (Example: 126 = 12μF)
3. Capacitance Tolerance:
   T = -15+50% (Standard for XTK, XTM, XTV)
   U = -15+75% (Standard for XTH, XTL)
   M = ±20% (Available by Special Order)
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. P = Polar
6. Insulation:
   0 = Uninsulated (Standard)
   1 = Mylar (+125°C limit)
   4 = Teflon (+200°C limit)
7. Terminal Configuration:
   See next page (A is standard)

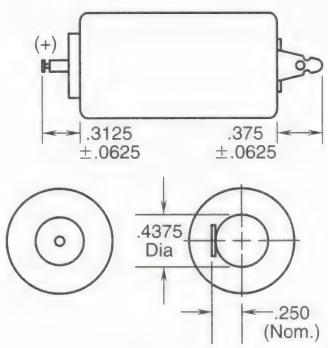
Types XTH - L - V Configurations
Wet Tantalum Capacitors

MALLORY

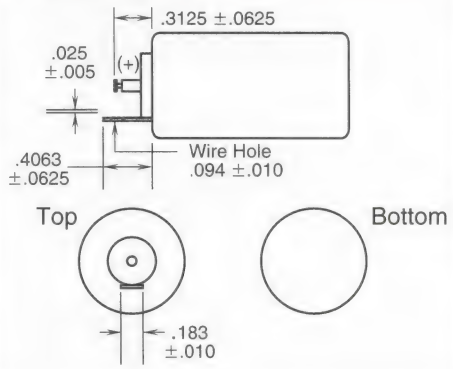
A Configuration



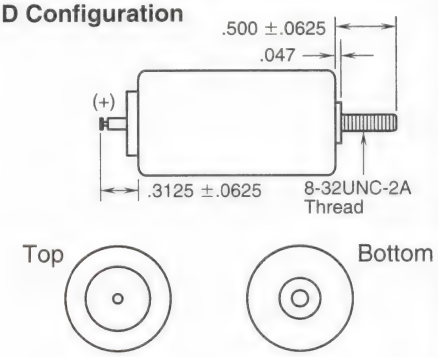
B Configuration



C Configuration

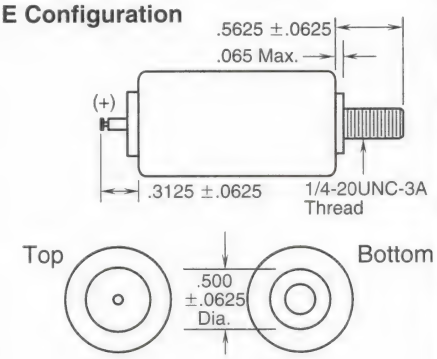


D Configuration



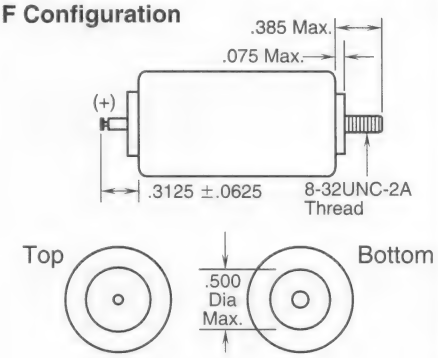
Negative screw lug is for indexing and negative connection only

E Configuration



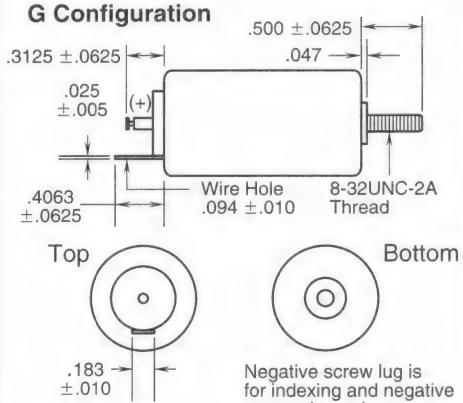
See Detail C on next page for suggested mounting method

F Configuration



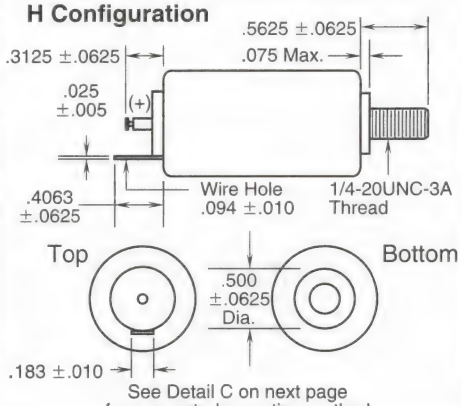
See Detail D on next page for suggested mounting method

G Configuration



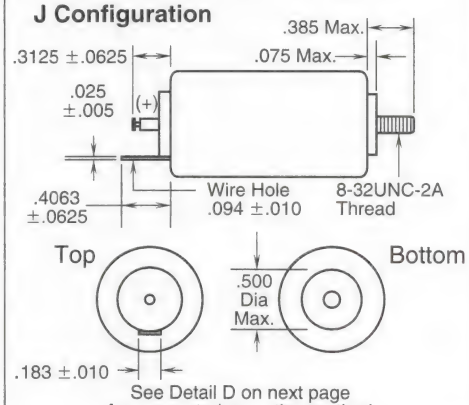
Negative screw lug is for indexing and negative connection only

H Configuration



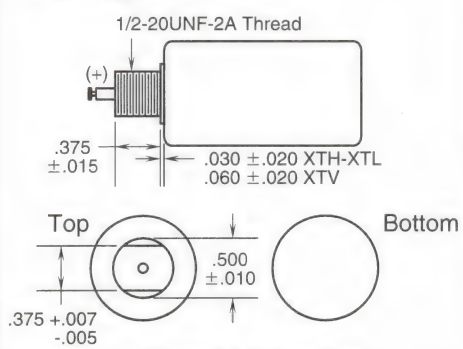
See Detail C on next page for suggested mounting method

J Configuration



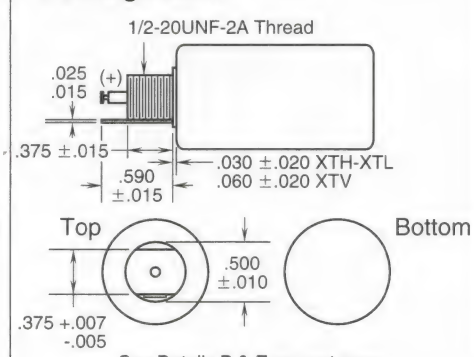
See Detail D on next page for suggested mounting method

K Configuration



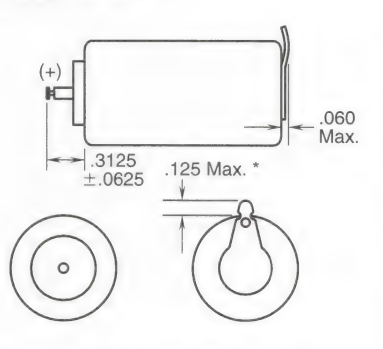
See Details B & E on next page for suggested mounting methods

L Configuration



See Details B & E on next page for suggested mounting methods

M Configuration

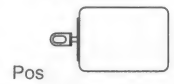


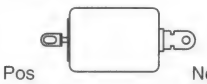
* Extends .125 on .875 dia. units only

Types XTK - M Configurations
Wet Tantalum Capacitors

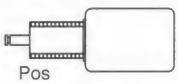
MALLORY

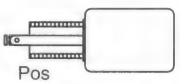
A Configuration

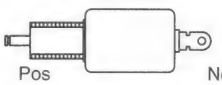

B Configuration


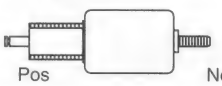
C Configuration


D Configuration

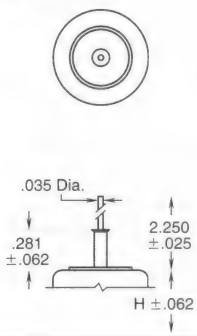

E Configuration


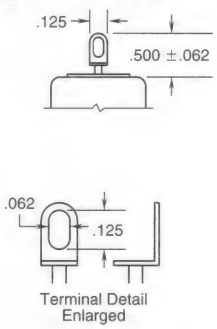
F Configuration


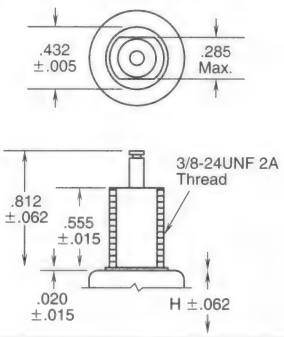
G Configuration


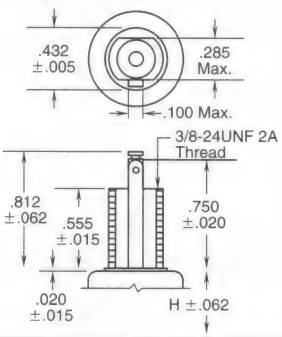
H Configuration


Positive Terminals for XTK and XTM

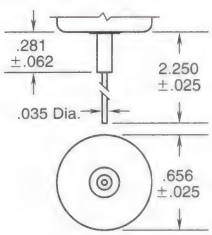
Configuration A


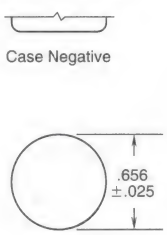
Configuration B, C & D


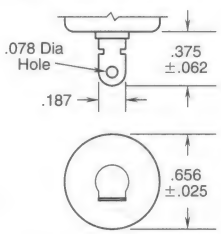
Configuration E, G & H


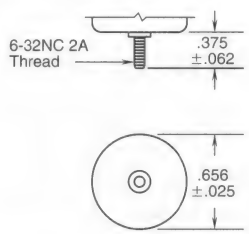
Configuration F


Negative Terminals for XTK and XTM

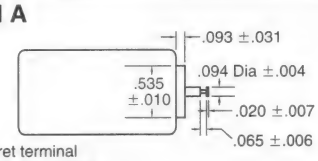
Configuration A


Configuration B, E & F


Configuration C & G


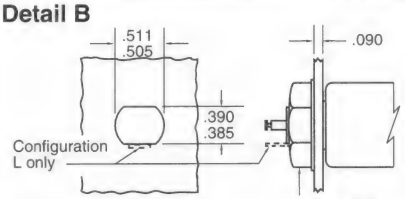
Configuration D & H


XTH, XTL and XTV Mounting Methods

Detail A


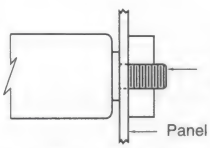
Turret terminal detail dimensions (Positive lead connections)

For configurations A, B, C, D, E, F, G, H, J and M

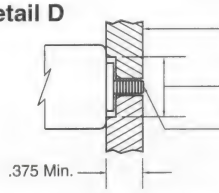
Detail B


For configurations K and L

Nut nearly flush with ends of threads

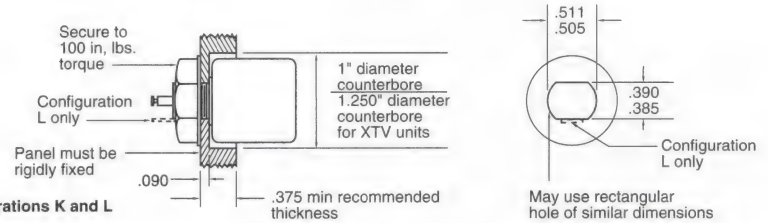
Detail C


For configurations E and H

Detail D


For configurations F and J

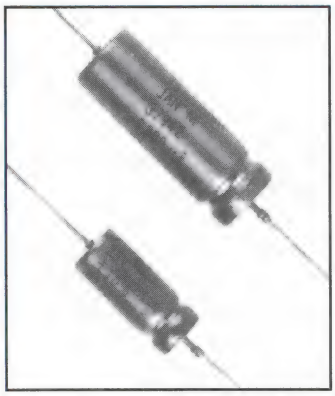
Not recommended for non-metal panels

Detail E


For configurations K and L

Type THT
Wet Tantalum Capacitors

MALLORY



- Tantalum Case Technology
- Hermetically Sealed
- Rugged Construction
- Stable in Hostile Environments
- 200°C Operating Temperature
- Up to 3 Volts Reverse Capability @ 85°C
- High Ripple Current Rating
- Low DCL
- Low ESR
- Long Active Life
- Long Shelf Life

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +200°C
with proper derating

Voltage Range:
6 to 125 VDC @ 85°C
3.6 to 75 VDC @ 200°C

Capacitance Range:
1.7 μF to 1200 μF

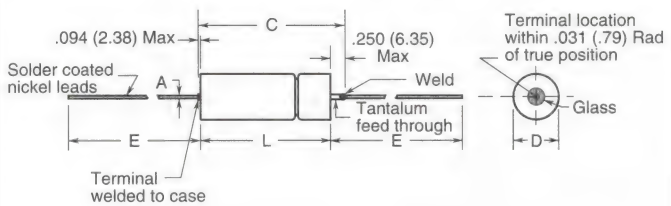
Tolerance Range:
±20%, ±10%, ±5%

Case Sizes: (Four)
.188 x .453 to .375 x 1.062

The maximum ripple current carrying capability at 40 kHz and 85°C is shown in the Standard Rating Table. Maximum ripple capability at other frequencies and temperatures can be determined using the following table based on 60% of the rated voltage.

Freq.	Ripple Multipliers at: ≤55°C	85°C	125°C	175°C	200°C
120 Hz	.60	.60	.27	.19	.13
1 kHz	.72	.72	.32	.23	.16
10 kHz	.88	.88	.40	.28	.19
40 kHz	1.0	1.0	.45	.32	.22
100 kHz	1.1	1.1	.50	.35	.24

Physical Specifications



Part Number Nomenclature

THT	505	K	050	P	6	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. THT Series - Tantalum Case/High Temperature
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 505 = 5 μF)
3. Capacitance Tolerance:
   M = ±20%, K = ±10%, J = ±5%
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. P = Polar
6. 6 = Kapton Sleeve
7. Case Size Code

DIMENSIONS

INCHES

Case ~~M~~	MIL	Uninsulated D ±.016	Uninsulated L +.031, -.016	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)
A	T1	.188	.453	.219	.608	.734	.025	#22	1.500	2.7
B	T2	.281	.641	.312	.796	.922	.025	#22	2.250	6.5
C	T3	.375	.766	.406	.921	1.047	.025	#22	2.250	12.0
F	T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	18.0

MILLIMETERS

Case ~~M~~	MIL	Uninsulated D ±.41	Uninsulated L +.79, -.41	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±6.35
A	T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
B	T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
C	T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
F	T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

6 WVDC @ 85°C, 3.6 WVDC @ 200°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	125°C	175°C	200°C	Max ESR Ω 120 Hz + 25°C	Max Ripple mA rms 40 kHz 85°C
30	A	THT306*006P6A	1	2	4	6	4.0	820
68	A	THT686*006P6A	1	2	4	6	3.2	960
140	B	THT147*006P6B	1	3	6	9	2.0	1200
270	B	THT277*006P6B	1	7	14	21	2.2	1375
330	C	THT337*006P6C	2	8	16	24	1.5	1800
560	C	THT567*006P6C	2	13	26	39	1.3	1900
1200	F	THT128*006P6F	3	14	28	42	1.0	2265

8 WVDC @ 85°C, 4.8 WVDC @ 200°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	125°C	175°C	200°C	Max ESR Ω 120 Hz + 25°C	Max Ripple mA rms 40 kHz 85°C
25	A	THT256*008P6A	1	2	4	6	4.0	820
56	A	THT566*008P6A	1	2	4	6	3.3	900
120	B	THT127*008P6B	1	2	4	6	2.2	1220
220	B	THT227*008P6B	1	7	14	21	2.2	1370
290	C	THT297*008P6C	2	6	12	18	1.6	1770
430	C	THT437*008P6C	2	14	28	42	1.4	1825
850	F	THT857*008P6F	4	16	32	48	0.9	2330

10 WVDC @ 85°C, 6 WVDC @ 200°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	125°C	175°C	200°C	Max ESR Ω 120 Hz + 25°C	Max Ripple mA rms 40 kHz 85°C
20	A	THT206*010P6A	1	2	4	6	4.0	820
47	A	THT476*010P6A	1	2	4	6	3.7	855
100	B	THT107*010P6B	1	4	8	12	2.0	1200
180	B	THT187*010P6B	1	7	14	21	2.2	1365
250	C	THT257*010P6C	2	10	20	30	1.6	1720
390	B	THT397*010P6B	2	16	32	48	1.5	1800
750	F	THT757*010P6F	4	16	32	48	0.9	2360

15 WVDC @ 85°C, 9 WVDC @ 200°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	125°C	175°C	200°C	Max ESR Ω 120 Hz + 25°C	Max Ripple mA rms 40 kHz 85°C
15	A	THT156*015P6A	1	2	3	4	4.4	780
33	A	THT336*015P6A	1	2	3	4	4.0	820
70	B	THT706*015P6B	1	4	6	8	2.5	1150
120	B	THT127*015P6B	1	7	11	14	2.0	1450
170	C	THT177*015P6C	2	10	15	20	2.0	1480
270	C	THT277*015P6C	2	16	24	32	1.6	1740
540	F	THT547*015P6F	6	24	36	48	1.0	2300

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%, J = ±5%

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type THT
Wet Tantalum Capacitors

MALLORY

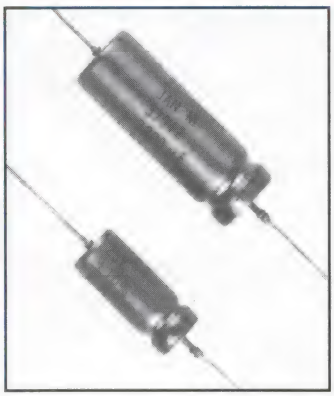
Cap µF	Case Code	Catalog Number	Max DCL µA 25°C	125°C	175°C	200°C	Max ESR Ω 120 Hz +25°C	Max Ripple mA rms 40 kHz 85°C
25 WVDC @ 85°C 12 WVDC @ 200°C								
10	A	THT106*025P6A	1	2	3	4	5.3	715
22	A	THT226*025P6A	1	2	3	4	4.0	825
50	B	THT506*025P6B	1	2	3	4	2.9	1130
100	B	THT107*025P6B	1	10	15	20	2.0	1435
120	C	THT127*025P6C	2	6	9	12	2.3	1450
180	C	THT187*025P6C	2	18	27	36	1.9	1525
350	F	THT357*025P6F	7	28	42	56	1.3	1970
30 WVDC @ 85°C 18 WVDC @ 200°C								
8	A	THT805*030P6A	1	2	3	4	6.6	640
15	A	THT156*030P6A	1	2	3	4	4.4	780
40	B	THT406*030P6B	1	5	8	10	3.3	1120
68	B	THT686*030P6B	1	8	12	16	2.5	1285
100	C	THT107*030P6C	2	12	18	24	2.3	1450
150	C	THT157*030P6C	2	18	27	36	2.3	1525
300	F	THT307*030P6F	8	32	48	64	1.4	1950
35 WVDC @ 85°C 21 WVDC @ 200°C								
7	A	THT705*035P6A	1	2	3	4	7.0	620
15	A	THT156*035P6A	1	2	3	4	6.2	660
35	B	THT356*035P6B	1	5	8	10	4.2	1000
68	B	THT686*035P6B	1	8	12	16	2.9	1195
82	C	THT826*035P6C	2	12	18	24	2.5	1400
120	C	THT127*035P6C	2	18	27	36	2.3	1490
270	F	THT277*035P6F	8	32	48	64	1.4	1950
50 WVDC @ 85°C 30 WVDC @ 200°C								
5	A	THT505*050P6A	1	2	3	4	8.0	580
10	A	THT106*050P6A	1	2	3	4	5.3	715
25	B	THT256*050P6B	1	5	8	10	4.3	1005
47	B	THT476*050P6B	1	9	14	18	3.1	1155
60	C	THT606*050P6C	2	12	18	24	2.7	1335
82	C	THT826*050P6C	2	16	24	32	2.4	1400
160	F	THT167*050P6F	8	32	48	64	1.4	1900

Cap µF	Case Code	Catalog Number	Max DCL µA 25°C	125°C	175°C	200°C	Max ESR Ω 120 Hz +25°C	Max Ripple mA rms 40 kHz 85°C
60 WVDC @ 85°C 36 WVDC @ 200°C								
4	A	THT405*060P6A	1	2	3	4	9.3	525
8.2	A	THT825*060P6A	1	2	3	4	6.5	625
20	B	THT206*060P6B	1	5	8	10	4.6	930
39	B	THT396*060P6B	1	9	14	18	3.4	1110
50	C	THT506*060P6C	2	12	18	24	2.7	1330
68	C	THT686*060P6C	2	16	24	32	2.5	1365
140	F	THT147*060P6F	8	32	48	64	1.5	1850
75 WVDC @ 85°C 45 WVDC @ 200°C								
3.5	A	THT355*075P6A	1	2	3	4	9.5	525
6.8	A	THT685*075P6A	1	2	3	4	6.8	610
15	B	THT156*075P6B	1	5	8	10	5.3	890
33	B	THT336*075P6B	1	10	15	20	4.0	1000
40	C	THT406*075P6C	2	12	18	24	3.1	1250
56	C	THT566*075P6C	2	17	26	34	2.6	1335
110	F	THT117*075P6F	9	36	54	72	1.5	1850
100 WVDC @ 85°C 60 WVDC @ 200°C								
2.5	A	THT255*100P6A	1	2	3	4	10.6	505
4.7	A	THT475*100P6A	1	2	3	4	8.5	565
11	B	THT116*100P6B	1	4	6	8	6.0	835
22	B	THT226*100P6B	1	9	14	18	4.5	965
30	C	THT306*100P6C	2	12	18	24	3.1	1240
43	C	THT436*100P6C	2	17	26	34	2.6	1335
86	F	THT866*100P6F	9	36	54	72	1.5	1800
125 WVDC @ 85°C 75 WVDC @ 200°C								
1.7	A	THT175*125P6A	1	2	3	4	15.6	415
3.6	A	THT365*125P6A	1	2	3	4	10.0	520
9.0	B	THT905*125P6B	1	5	8	10	7.4	755
14	B	THT146*125P6B	1	7	11	14	5.7	860
18	C	THT186*125P6C	2	9	14	18	3.7	1130
25	C	THT256*125P6C	2	13	20	26	3.2	1200
56	F	THT566*125P6F	10	40	60	80	1.5	1800

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%, J = ±5%

Type THX
Wet Tantalum Capacitors

MALLORY



- Extended Range
- Tantalum Case Technology
- Hermetically Sealed
- Rugged Construction
- Stable in Hostile Environments
- Up to 3 Volts Reverse Capability
- High Ripple Current Rating
- Low DCL and ESR
- Long Active Life
- Long Shelf Life

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +175°C
with proper derating

Voltage Range:
6 to 125 VDC @ 85°C
4 to 85 VDC @ 175°C

Capacitance Range:
6.8 μF to 2200 μF

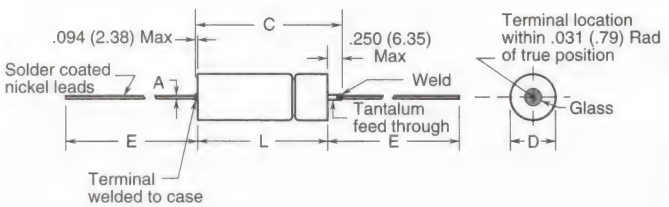
Tolerance Range:
±20%, ±10%

Case Sizes: (Four)
.188 x .453 to .375 x 1.062

The maximum ripple current carrying capability at 40 kHz and 85°C is shown in the Standard Rating Table. Maximum ripple capability at other frequencies and temperatures can be determined using the following table based on 60% of the rated voltage.

Freq.	Ripple Multipliers at: ≤55°C	85°C	125°C	175°C
120 Hz	.60	.60	.27	.19
1 kHz	.72	.72	.32	.23
10 kHz	.88	.88	.40	.28
40 kHz	1.0	1.0	.45	.32
100 kHz	1.1	1.1	.50	.35

Physical Specifications



Part Number Nomenclature

THX	228	K	006	P	6	F
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. THX Series - High Capacity Tantalum Case/Hi Temperature
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 228 = 2200 μF)
3. Capacitance Tolerance:
   M = ±20%, K = ±10%
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. P = Polar
6. 6 = Kapton Sleeve
7. Case Size Code

DIMENSIONS

Case ~~M~~	MIL	INCHES Uninsulated D ±.016	L +.031, -.016	Insulated D Max	L Max	C Max	A Lead Dia. Nom	AWG	E Lead Lgth. ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)	Case ~~M~~	MIL	MILLIMETERS Uninsulated D ±.41	L +.79, -.41	Insulated D Max	L Max	C Max	A Lead Dia Nom	AWG	E Lead Lgth ±6.35
A	T1	.188	.453	.219	.608	.734	.025	#22	1.500	2.7	A	T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
B	T2	.281	.641	.312	.796	.922	.025	#22	2.250	6.5	B	T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
C	T3	.375	.766	.406	.921	1.047	.025	#22	2.250	12.0	C	T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
F	T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	18.0	F	T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

6 WVDC @ 85°C
4 WVDC @ 175°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	125°C	175°C	Max ESR Ω 120 Hz + 25°C	Max DF % 120 Hz +25°C	Max Ripple mA rms 40kHz 85°C
220	A	THX227*006P6A	2	9	18	2.7	50	1010
820	B	THX827*006P6B	3	14	28	2.2	155	1550
1500	C	THX158*006P6C	5	20	40	1.3	172	1930
2200	F	THX228*006P6F	6	24	48	.9	170	2330

8 WVDC @ 85°C
5 WVDC @ 175°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	125°C	175°C	Max ESR Ω 120 Hz + 25°C	Max DF % 120 Hz +25°C	Max Ripple mA rms 40kHz 85°C
180	A	THX187*008P6A	2	9	18	2.4	36	1010
680	B	THX687*008P6B	3	14	28	2.3	130	1550
1500	C	THX158*008P6C	5	20	40	1.3	170	1930
1800	F	THX188*008P6F	7	25	50	.9	195	2330

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%

10 WVDC @ 85°C
7 WVDC @ 175°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	125°C	175°C	Max ESR Ω 120 Hz + 25°C	Max DF % 120 Hz +25°C	Max Ripple mA rms 40kHz 85°C
120	A	THX127*010P6A	2	6	12	2.8	28	930
150	A	THX157*010P6A	2	9	18	2.7	34	960
470	B	THX477*010P6B	3	9	18	1.7	67	1500
560	B	THX567*010P6B	3	16	32	1.6	76	1550
1000	C	THX108*010P6C	6	18	36	1.2	98	1930
1200	C	THX128*010P6C	5	20	40	1.1	117	1930
1200	F	THX128*010P6F	7	25	50	.9	90	2330
1500	F	THX158*010P6F	7	25	50	.9	114	2330

15 WVDC @ 85°C
10 WVDC @ 175°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	125°C	175°C	Max ESR Ω 120 Hz + 25°C	Max DF % 120 Hz +25°C	Max Ripple mA rms 40kHz 85°C
82	A	THX826*015P6A	2	6	12	2.9	20	915
100	A	THX107*015P6A	2	9	18	3.6	30	930
390	B	THX397*015P6B	3	16	32	1.8	59	1470
680	C	THX687*015P6C	6	18	36	1.2	71	1860
820	C	THX827*015P6C	6	24	48	1.1	80	1930
1000	F	THX108*015P6F	8	32	64	.9	75	2330

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type THX
Wet Tantalum Capacitors

MALLORY

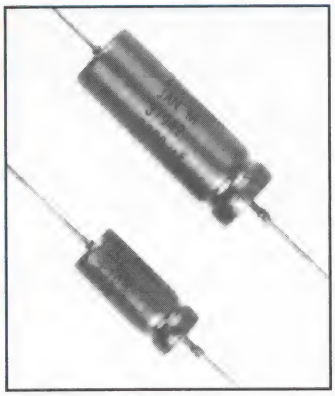
Cap µF	Case Code	Catalog Number	Max DCL µA 25°C	Max DCL µA 125°C	Max DCL µA 175°C	Max ESR Ω 120 Hz + 25°C	Max DF % 120 Hz +25°C	Max Ripple mA rms 40kHz 85°C
25 WVDC @ 85°C 15 WVDC @ 175°C								
68	A	THX686*025P6A	2	9	18	3.9	22	850
270	B	THX277*025P6B	3	16	32	1.8	42	1430
560	C	THX567*025P6C	7	28	56	1.6	76	1750
680	F	THX687*025P6F	8	32	64	1.1	61	2120
30 WVDC @ 85°C 20 WVDC @ 175°C								
47	A	THX476*030P6A	2	6	12	3.6	14	830
56	A	THX566*030P6A	2	9	18	3.2	15	890
150	B	THX157*030P6B	3	9	18	2.2	28	1340
180	B	THX187*030P6B	3	9	18	2.0	30	1400
220	B	THX227*030P6B	3	16	32	2.3	42	1400
390	C	THX397*030P6C	6	18	36	1.4	47	1740
470	C	THX477*030P6C	8	32	64	1.3	53	1800
560	F	THX567*030P6F	9	36	72	1.1	54	2040
35 WVDC @ 85°C 23 WVDC @ 175°C								
39	A	THX396*035P6A	2	6	12	3.7	12	820
330	C	THX337*035P6C	6	18	36	1.6	44	1640
470	F	THX477*035P6F	9	36	72	1.1	46	2040
50 WVDC @ 85°C 30 WVDC @ 175°C								
33	A	THX336*050P6A	2	9	18	4.0	11	795
120	B	THX127*050P6B	4	24	48	2.2	22	1315
270	C	THX277*050P6C	8	32	64	1.6	37	1560
330	F	THX337*050P6F	9	36	72	1.3	32	2040

Cap µF	Case Code	Catalog Number	Max DCL µA 25°C	Max DCL µA 125°C	Max DCL µA 175°C	Max ESR Ω 120 Hz + 25°C	Max DF % 120 Hz +25°C	Max Ripple mA rms 40kHz 85°C
60 WVDC @ 85°C 40 WVDC @ 175°C								
27	A	THX276*060P6A	3	12	24	4.0	9	785
100	B	THX107*060P6B	4	20	40	2.3	20	1240
220	C	THX227*060P6C	8	32	64	1.6	30	1520
270	F	THX277*060P6F	9	36	72	1.2	27	1970
75 WVDC @ 85°C 50 WVDC @ 175°C								
22	A	THX226*075P6A	3	12	24	4.0	8	745
68	B	THX686*075P6B	4	16	32	2.6	15	1200
82	B	THX826*075P6B	4	24	48	2.2	15	1200
180	C	THX187*075P6C	8	36	72	1.6	24	1490
220	F	THX227*075P6F	10	40	80	2.0	24	1900
100 WVDC @ 85°C 65 WVDC @ 175°C								
10	A	THX106*100P6A	3	12	36	5.9	4	800
39	B	THX396*100P6B	5	24	48	3.2	10.4	1300
68	C	THX686*100P6C	10	40	80	2.0	11.3	1600
120	F	THX127*100P6F	12	48	96	2.5	25	2000
125 WVDC @ 85°C 85 WVDC @ 175°C								
6.8	A	THX685*125P6A	3	12	24	10.6	6	700
27	B	THX276*125P6B	5	24	48	3.2	7.2	1200
47	C	THX476*125P6C	10	40	80	2.0	7.9	1500
82	F	THX826*125P6F	12	48	96	2.5	17.4	1900

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%

Type THD/TXTE NEW
Wet Tantalum Capacitors

MALLORY



- Extended Range (Higher C/V Rating Per Case Size vs Standard CLR81 Series)
- Tantalum Case Technology
- Hermetically Sealed
- Rugged Construction
- Stable in Hostile Environments
- Up to 1 Volt Reverse Capability
- High Ripple Current Rating
- Low DCL and ESR
- Long Active Life
- Long Shelf Life

THD GENERAL SPECIFICATIONS

Operating Temperature:
-20°C to +175°C
with proper derating

Voltage Range:
25 to 125 VDC @ 85°C
15 to 85 VDC @ 175°C

Capacitance Range:
10 μF to 1600 μF

Tolerance Range:
±20%, ±10%

Case Sizes: (Four)
.188 x .453 to .375 x .1.062

TXTE GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
with proper derating

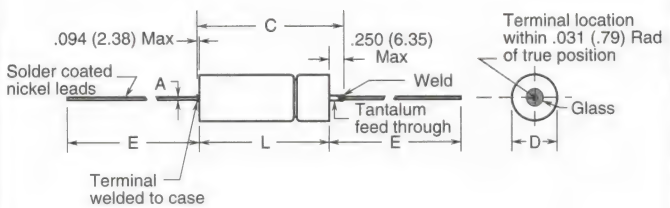
Voltage Range:
25 to 125 VDC @ 85°C
15 to 85 VDC @ 125°C

Capacitance Range:
10 μF to 1600 μF

Tolerance Range:
±20%, ±10%

Case Sizes: (Four)
.188 x .453 to .375 x .1.062

Physical Specifications



Part Number Nomenclature

THD/ TXTE	228	K	006	P	6	F
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. TXTE Series - High Capacity Tantalum Case
   THD Series - High Temperature
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 228 = 2200 μF)
3. Capacitance Tolerance:
   M = ±20%, K = ±10%
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. P = Polar
6. 6 = Kapton Sleeve, 1 = Mylar Sleeve
7. Case Size Code

DIMENSIONS

INCHES

Case ~~M~~ MIL		Uninsulated D ±.016	Uninsulated L +.031, -.016	Insulated D Max	Insulated L Max	C Max	A Lead Dia. Nom	A Lead Dia. AWG	E Lead Lgth. ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)
A	T1	.188	.453	.219	.608	.734	.025	#22	1.500	2.7
B	T2	.281	.641	.312	.796	.922	.025	#22	2.250	6.5
C	T3	.375	.766	.406	.921	1.047	.025	#22	2.250	12.0
F	T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	18.0

MILLIMETERS

Case ~~M~~ MIL		Uninsulated D ±.41	Uninsulated L +.79, -.41	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±6.35
A	T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
B	T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
C	T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
F	T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

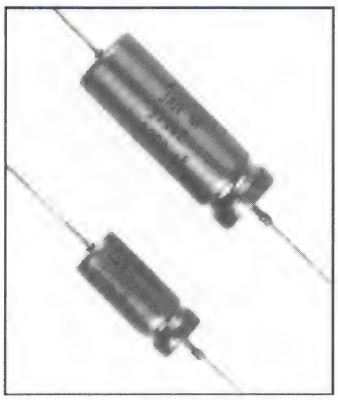
* Contact NACC for Product Availability and Samples.

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type TNP
Wet Tantalum Capacitors

NEW

MALLORY



- Non-Polar Operation
- Tantalum Case Technology
- Hermetically Sealed
- Rugged Construction
- Miniature Size
- Low DCL
- Low ESR
- Long Active Life
- Long Shelf Life

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
with proper derating

Voltage Range:
6 to 100VNP @ 85°C
4 to 67 VNP @ 125°C

Capacitance Range:
3 uF to 410 uF

Tolerance Range:
±20%, ±10%

Case Sizes: (Four)
.188 x .453 to .375 x 1.062

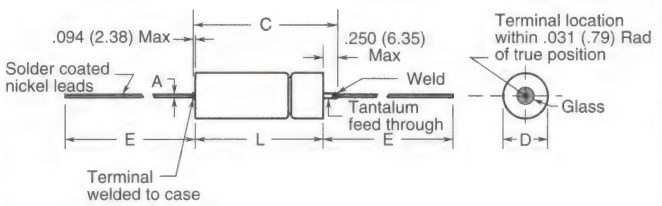
APPLICATIONS:

High ripple voltage bypass, phase splitting for low voltage motors.

Low frequency tuned circuits.

Crossover networks.

Physical Specifications



Part Number Nomenclature

TNP	106	M	025	N	1	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. TNP Series - Tantalum Case/Non-Polar
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits:Significant Figures
   Third digit: Number of zeros (Example: 106 = 10 μF)
3. Capacitance Tolerance:
   M = ±20%, K = ±10%
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. N = Non-Polar
6. 1 = Mylar Sleeve 6 = Kapton Sleeve
7. Case

DIMENSIONS

Case ~~M~~	MIL	INCHES Insulated D Max	L Max	C Max	A Lead Dia Nom	AWG	E Lead Length ±.250	Approximate Weight (1 gram = .035 Oz.)	Case ~~M~~	MIL	MILLIMETERS Insulated D Max	L Max	C Max	A Lead Dia Nom	AWG	E Lead Length ±6.35
A	T1	.219	.608	.734	.025	#22	1.500	2.7	A	T1	5.56	15.45	.734	.64	#22	38.10
B	T2	.312	.796	.922	.025	#22	2.250	6.5	B	T2	7.92	20.22	.922	.64	#22	57.15
C	T3	.406	.921	1.047	.025	#22	2.250	12.0	C	T3	10.31	23.40	1.047	.64	#22	57.15
F	T4	.406	1.217	1.343	.025	#22	2.250	18.0	F	T4	10.31	30.91	1.343	.64	#22	57.15

6 WVNP @ 85°C / 4 WVNP @ 125°C

Cap μF	Case Code	Catalog Number
40	A	TNP406*006N1A
90	B	TNP906*006N1B
200	C	TNP207*006N1C
410	F	TNP417*006N1F

10 WVNP @ 85°C / 7 WVNP @ 125°C

Cap μF	Case Code	Catalog Number
25	A	TNP256*010N1A
55	B	TNP556*010N1B
130	C	TNP137*010N1C
250	F	TNP257*010N1F

15 WVNP @ 85°C / 10 WVNP @ 125°C

Cap μF	Case Code	Catalog Number
15	A	TNP156*015N1A
17	A	TNP176*015N1A
40	B	TNP406*015N1B
90	C	TNP906*015N1C
180	F	TNP187*015N1F

25 WVNP @ 85°C / 17 WVNP @ 125°C

Cap μF	Case Code	Catalog Number
10	A	TNP106*025N1A
25	B	TNP256*025N1B
56	C	TNP566*025N1C
110	F	TNP117*025N1F

30 WVNP @ 85°C / 20 WVNP @ 125°C

Cap μF	Case Code	Catalog Number
9	A	TNP905*030N1A
20	B	TNP206*030N1B
47	C	TNP476*030N1C
90	F	TNP906*030N1F

50 WVNP @ 85°C / 33 WVNP @ 125°C

Cap μF	Case Code	Catalog Number
5	A	TNP505*050N1A
12	B	TNP126*050N1B
28	C	TNP286*050N1C
50	F	TNP506*050N1F

75 WVNP @ 85°C / 50WVNP @ 125°C

Cap μF	Case Code	Catalog Number
4	A	TNP405*075N1A
8	B	TNP805*075N1B
19	C	TNP196*075N1C
35	F	TNP356*075N1F

100 WVNP @ 85°C / 67 WVNP @ 125°C

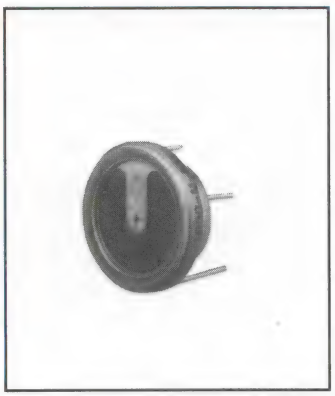
Cap μF	Case Code	Catalog Number
3	A	TNP305*100N1A
6	B	TNP605*100N1B
14	C	TNP146*100N1C
25	F	TNP256*100N1F

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%

❁ Contact NACC for more information

Type TBS All-Tantalum Button (Formerly W13)
Wet Tantalum Capacitors

MALLORY



- High AC and Surge Currents
- All Tantalum Construction
- Qualified to MIL-C- 83500
- 3 Volt Reverse Voltage To 125°C
- 100% Burn In
- Custom Designs Available

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +150°C
with voltage derating

Voltage Range:
6 to 125 VDC

Capacitance Range:
47μF to 1500 μF

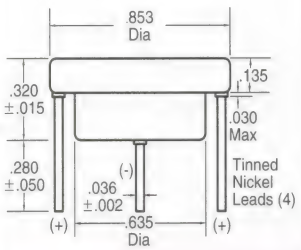
Ripple Current:
Max at 85°C: 40kHz up to 2.9A rms, dependent on C/V rating

Leakage Current:
At 25°C: 2 μA to 8 μA depending on voltage rating

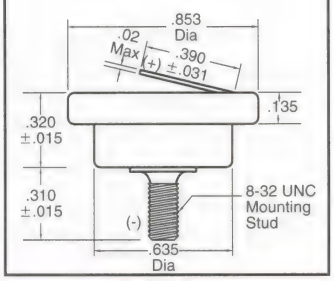
Approximate Weight:
Pin Mount: 17.3 grams
Stud mount: 18.1 grams

The TBS design was the first unit of All-Tantalum construction. It was developed to provide a wet-slug unit with no metal migration, or reverse voltage and shelf life degradation. Since the 1960's millions of units in critical applications have demonstrated unsurpassed reliability and performance. The TBS series is qualified to MIL-C-83500 and meets the equivalent requirements of MIL-C-39006. The capacitors are also approved to NATO and European standards.

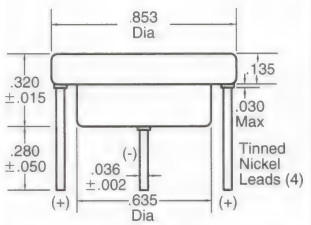
Style 'P' Pin Mount With Anode Lead (CRL01)



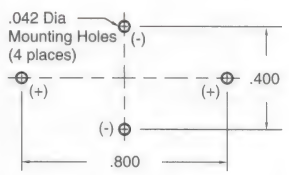
Style 'S' Stud Mount (CRL02)



Style 'B' Pin Mount Without Anode Lead (CRL03)



Mounting Schematic for Pin Mount Styles



MIL Qualified Ratings

VDC @ 85°C	Cap μF	Cap Tol %	Catalog Number	Equivalent MIL Part No M83500/01---- PC Style CRL 01	STUD Style CRL 02	PC (Bare) Style CRL 03
6	1200	20	TBS1200M0006*	0001	1001	2001
8	1000	20	TBS1000M0008*	0002	1002	2002
10	820	20	TBS0820M0010*	0003	1003	2003
15	680	10	TBS0680K0015*	0004	1004	2004
15	680	20	TBS0680M0015*	0005	1005	2005
20	560	10	TBS0560K0020*	0006	1006	2006
20	560	20	TBS0560M0020*	0007	1007	2007
20	470	10	TBS0470K0020*	0008	1008	2008
20	470	20	TBS0470M0020*	0009	1009	2009
20	390	10	TBS0390K0020*	0010	1010	2010
20	390	20	TBS0390M0020*	0011	1011	2011
30	330	10	TBS0330K0030*	0012	1012	2012
30	330	20	TBS0330M0030*	0013	1013	2013
30	270	10	TBS0270K0030*	0014	1014	2014
30	270	20	TBS0270M0030*	0015	1015	2015
50	220	10	TBS0220K0050*	0016	1016	2016
50	220	20	TBS0220M0050*	0017	1017	2017
50	180	10	TBS0180K0050*	0018	1018	2018
50	180	20	TBS0180M0050*	0019	1019	2019
50	150	10	TBS0150K0050*	0020	1020	2020
50	150	20	TBS0150M0050*	0021	1021	2021
75	120	10	TBS0120K0075*	0022	1022	2022
75	120	20	TBS0120M0075*	0023	1023	2023
75	100	10	TBS0100K0075*	0024	1024	2024
75	100	20	TBS0100M0075*	0025	1025	2025
75	82	10	TBS0082K0075*	0026	1026	2026
75	82	20	TBS0082M0075*	0027	1027	2027
75	68	10	TBS0068K0075*	0028	1028	2028
75	68	20	TBS0068M0075*	0029	1029	2029
100	56	10	TBS0056K0100*	0030	1030	2030
100	56	20	TBS0056M0100*	0031	1031	2031
125	47	10	TBS0047K0125*	0032	1032	2032
125	47	20	TBS0047M0125*	0033	1033	2033

TO ORDER BY MIL NUMBER:

Indicate the prefix M83500/01 followed by the applicable MIL dash number.
Example: For M83500/01-1001; order M83500/011001

The Commercial 150°C Ratings listed below are designed to give high stability up to 200°C. Every unit is burned in for 16 hours at 200°C prior to final test. In addition to standard military applications, this device is aimed at down the hole drilling activities, high temperature engine control and other high stress environments.

The Commercial Extended Range Ratings are an extension of the MIL ratings, utilizing select materials to result in a capacitor with higher CV product while retaining all the essential features of the MIL range.

Commercial 150°C Ratings

VDC @ 150°C	Cap μF	Cap Tol %	Catalog Number
6	330	20	TBS0330M0006*
10	270	20	TBS0270M0010*
15	220	20	TBS0220M0015*
25	150	20	TBS0150M0025*
35	100	20	TBS0100M0035*
50	68	20	TBS0068M0050*
75	47	20	TBS0047M0075*

Commercial Extended Range Ratings

VDC @ 85°C	Cap μF	Cap Tol %	Catalog Number
6	1500	20	TBS1500M0006*
10	1000	20	TBS1000M0010*
10	1200	20	TBS1200M0010*
15	680	20	TBS0680M0015*
15	820	20	TBS0820M0015*
25	470	20	TBS0470M0025*
25	560	20	TBS0560M0025*
40	270	20	TBS0270M0040*
40	330	20	TBS0330M0040*
40	390	20	TBS0390M0040*
60	220	20	TBS0220M0060*
75	150	20	TBS0150M0075*
75	180	20	TBS0180M0075*
100	100	20	TBS0100M0100*
100	120	20	TBS0120M0100*
125	82	20	TBS0082M0125*

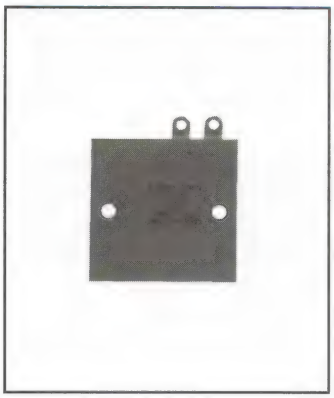
*** Insert Style letter:**

P = Pin Mount with Anode Lead (CRL01)

S = Screw Mount (CRL02)

B = Pin Mount without Anode Lead (CRL03)

Type W14 All-Tantalum Module
Wet Tantalum Capacitors



- High AC and Surge Currents
- All Tantalum Construction Of Constituent Units
- Long Operating & Shelf Life
- 3 Volt Reverse Voltage to 125°C
- High Efficiency Package
- Custom Designs Available

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
with voltage derating

Voltage Range:
6 to 125 VDC

Capacitance Range:
94 μF to 7500 μF

Ripple Current:
Max at 85°C, 40kHz up to 11.7 Arms, dependent on C/V rating

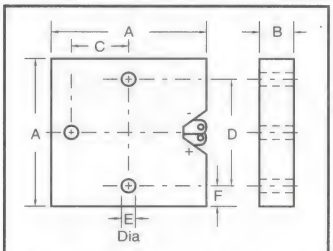
Leakage Current:
At 25°C: 15μA to 75μA depending on voltage rating

Module Weight:
130 Grams Approximate

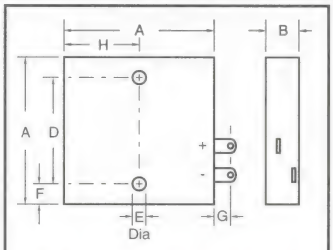
The W14 series capacitor module has been designed to meet the requirements for a very high CV device, in excess of what is available in an individual capacitor. The standard arrangement of five type TBS units connected in parallel achieves excellent volumetric efficiency.

An experienced application engineering department is available to assist in the design of special packages to meet specific customer needs for both prototype and production quantities.

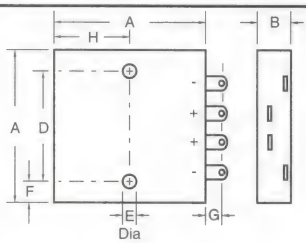
Dimensions: (Inches) (Unless specified, tolerances ±.010)	A max	B max	C ctrs	D ctrs	E dia	F dim	G min	H dim
	2.080	.460	.750	1.500	.190	.260	.170	1.000



Type MA - Standard 2-Terminal
A package of five TBS type units connected in parallel.



❁ **Type MB - Off-Set Terminal**
Identical to the type MA, but with protruding terminals.



Type MC - Four Terminal
This arrangement has a bank of two parallel connected TBS units and a bank of three parallel connected TBS units. Each bank has a terminal pair.

VDC @ 85°C	Cap μF	Cap Tol %	Catalog Number
Standard Range			
6	6000	20	W146000M0006MA
8	5000	20	W145000M0008MA
10	4100	20	W144100M0010MA
15	3400	20	W143400M0015MA
20	2800	20	W142800M0020MA
20	2350	20	W142350M0020MA
20	1950	20	W141950M0020MA
30	1650	20	W141650M0030MA
30	1350	20	W141350M0030MA
50	1100	20	W141100M0050MA
50	900	20	W14900M0050MA
50	750	20	W14750M0050MA
75	600	20	W14600M0075MA
75	500	20	W14500M0075MA
75	410	20	W14410M0075MA
75	340	20	W14340M0075MA
100	280	20	W14280M0100MA
125	235	20	W14235M0125MA
High Cap Range			
6	7500	20	W147500M0006MA
10	6000	20	W146000M0010MA
10	5000	20	W145000M0010MA
15	3400	20	W143400M0015MA
15	4100	20	W144100M0015MA
25	2800	20	W142800M0025MA
25	2350	20	W142350M0025MA
40	1950	20	W141950M0040MA
40	1650	20	W141650M0040MA
40	1350	20	W141350M0040MA
60	1100	20	W141100M0060MA
75	900	20	W14900M0075MA
75	750	20	W14750M0075MA
100	600	20	W14600M0100MA
100	500	20	W14500M0100MA
125	410	20	W14410M0125MA

VDC @ 85°C	Cap μF	Cap Tol %	Catalog Number
Standard Range			
6	6000	20	W146000M0006MB
8	5000	20	W145000M0008MB
10	4100	20	W144100M0010MB
15	3400	20	W143400M0015MB
20	2800	20	W142800M0020MB
20	2350	20	W142350M0020MB
20	1950	20	W141950M0020MB
30	1650	20	W141650M0030MB
30	1350	20	W141350M0030MB
50	1100	20	W141100M0050MB
50	900	20	W14900M0050MB
50	750	20	W14750M0050MB
75	600	20	W14600M0075MB
75	500	20	W14500M0075MB
75	410	20	W14410M0075MB
75	340	20	W14340M0075MB
100	280	20	W14280M0100MB
125	235	20	W14235M0125MB
High Cap Range			
6	7500	20	W147500M0006MB
10	6000	20	W146000M0010MB
10	5000	20	W145000M0010MB
15	3400	20	W143400M0015MB
15	4100	20	W144100M0015MB
25	2800	20	W142800M0025MB
25	2350	20	W142350M0025MB
40	1950	20	W141950M0040MB
40	1650	20	W141650M0040MB
40	1350	20	W141350M0040MB
60	1100	20	W141100M0060MB
75	900	20	W14900M0075MB
75	750	20	W14750M0075MB
100	600	20	W14600M0100MB
100	500	20	W14500M0100MB
125	410	20	W14410M0125MB

VDC @ 85°C	Cap μF	Cap Tol %	Catalog Number
(Right Hand) Terminal Pair 1			
6	2400	20	W1424—M06—MC
8	2000	20	W1420—M08—MC
10	1640	20	W1416—M10—MC
15	1360	20	W1413—M15—MC
20	1120	20	W1411—M20—MC
20	940	20	W1494—M20—MC
20	780	20	W1478—M20—MC
30	660	20	W1466—M30—MC
30	540	20	W1454—M30—MC
50	440	20	W1444—M50—MC
50	360	20	W1436—M50—MC
50	300	20	W1430—M50—MC
75	240	20	W1424—M75—MC
75	200	20	W1420—M75—MC
75	164	20	W1416—M75—MC
75	136	20	W1413—M75—MC
100	112	20	W1411—M10—MC
125	94	20	W1494—M12—MC

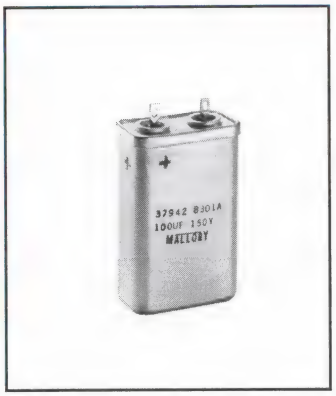
VDC @ 85°C	Cap μF	Cap Tol %	Catalog Number
(Left Hand) Terminal Pair 2			
6	3600	20	W14—36M—06MC
8	3000	20	W14—30M—08MC
10	2460	20	W14—24M—10MC
15	2040	20	W14—20M—15MC
20	1680	20	W14—16M—20MC
20	1410	20	W14—14M—20MC
20	1170	20	W14—11M—20MC
30	990	20	W14—99M—30MC
30	810	20	W14—81M—30MC
50	660	20	W14—66M—50MC
50	540	20	W14—54M—50MC
50	450	20	W14—45M—50MC
75	360	20	W14—36M—75MC
75	300	20	W14—30M—75MC
75	246	20	W14—24M—75MC
75	204	20	W14—20M—75MC
100	168	20	W14—16M—10MC
125	141	20	W14—14M—12MC

Assume the Right Hand Terminals are to be 1640 μF/10 Volts and the Left Hand Terminals are to be 3600 μF/6 Volts
The Part Number would be W141636M1006MC

❁Left hand Terminal Lead Standard as shown.
For Right hand terminal location contact N.A.C.C.

Type TMX - All-Tantalum Module
Wet Tantalum Capacitors

MALLORY



- High Capacitance per Case Size
- Hermetic Seal
- All Tantalum Construction Of Constituent Units
- Wide Operating Temp Range
- Temperature & Life Stability
- Low DCL
- Long Shelf Life
- Very High Ripple Current Capability
- Reverse Voltage Capability
- High Freq and Random Vibration - 20g's

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
with voltage derating

Voltage Range:
6 to 250 VDC @ 85°C
4 to 165 VDC @ 125°C

Capacitance:
to 39,600 μF

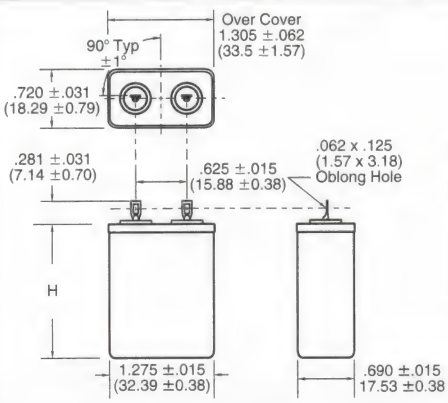
Tolerance:
±10%, ±20%

Ripple Current Capability:
to 41.4 Amps @ 40 kHz

The TMX capacitor is a module consisting of several TXT (M39006/25) wet slug, all-tantalum units wired in parallel, insulated and mounted in a rectangular metal case.

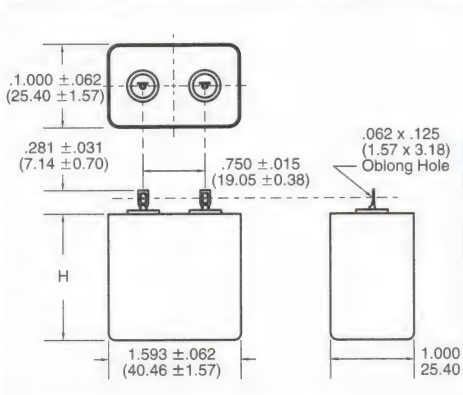
The case is potted with a compound that provides excellent thermal conductivity, high heat performance, increased shock resistance and improved coefficient of thermal expansion.

The assembly leads are brought out through glass-to-metal hermetic seals on the cover and the cover is soldered to the container.



A Case

H Dimensions		
Case Code	Inches ±.031	(mm) ±0.79
A1	1.062	26.97
A2	1.375	34.93
A3	1.625	41.28
A4	2.000	50.80
A5	2.500	63.50



B Case

H Dimensions		
Case Code	Inches ±.031	(mm) ±0.79
B1	1.500	38.10
B2	1.875	47.63
B3	2.250	57.15
B4	2.625	66.68
B5	3.000	76.20
B6	3.375	85.73
B7	3.750	95.25

RIPPLE CURRENT MULTIPLIERS FOR FREQUENCY, TEMPERATURE, AND APPLIED PEAK VOLTAGE

Applied Voltage in Percent of Rated WVDC	Ripple Current Frequency																			
	120 Hz				1 kHz				10 kHz				40 kHz				100 kHz			
	Operating Temperature °C																			
	≤55°	85°	105°	125°	≤55°	85°	105°	125°	≤55°	85°	105°	125°	≤55°	85°	105°	125°	≤55°	85°	105°	125°
	Ripple Current Multipliers																			
100%	.60	.39	—	—	.72	.45	—	—	.88	.55	—	—	1.0	.63	—	—	1.1	.69	—	—
90%	.60	.46	—	—	.72	.55	—	—	.88	.67	—	—	1.0	.77	—	—	1.1	.85	—	—
80%	.60	.52	.35	—	.72	.62	.42	—	.88	.76	.52	—	1.0	.87	.59	—	1.1	.96	.65	—
70%	.60	.58	.44	—	.72	.70	.52	—	.88	.85	.64	—	1.0	.97	.73	—	1.1	1.07	.80	—
66-2/3% and below	.60	.60	.46	.27	.72	.72	.55	.32	.88	.88	.68	.40	1.0	1.0	.77	.45	1.1	1.1	.85	.50

Part Number Nomenclature

TMX	458	K	006	P	0	A1
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. TMX Series - CLR81 All-Tantalum Module
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 458 = 4500μF)
3. Capacitance Tolerance:
   M = ±20%, K = ±10%
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. P = Polar
6. 0 = Indicates terminals insulated from bare metal case
7. Case Size Code

Type TMX - All-Tantalum Module
Wet Tantalum Capacitors

MALLORY

Cap µF	Case Code	Catalog Number	Max 85°C 40 kHz Ripple (Amps rms)	DC Leakage µA (max) +25°C	DC Leakage µA (max) +85°C & +125°C	Max ESR Ω +25°C	Max Z @ -55°C Ω
6 WVDC; 7 VDC Surge @ 85°C 4 WVDC; 4.7 VDC Surge @ 125°C							
4,500	A1	TMX458*006P0A1	5.7	15	60	.13	6.0
6,000	A2	TMX608*006P0A2	7.6	20	80	.10	5.0
7,500	A3	TMX758*006P0A3	9.5	25	100	.08	4.0
9,000	A4	TMX908*006P0A4	11.4	30	120	.067	3.0
12,000	A5	TMX129*006P0A5	15.2	40	160	.05	2.5
13,200	B1	TMX1328*006P0B1	13.8	36	144	.075	1.0
17,600	B2	TMX1768*006P0B2	18.4	48	192	.056	.80
22,000	B3	TMX229*006P0B3	23.0	60	240	.045	.65
26,400	B4	TMX2648*006P0B4	27.6	72	288	.037	.54
30,800	B5	TMX3088*006P0B5	32.2	84	336	.032	.46
35,200	B6	TMX3528*006P0B6	36.8	96	384	.028	.40
39,600	B7	TMX3968*006P0B7	41.2	108	432	.025	.36
8 WVDC; 9.2 VDC Surge @ 85°C 5 WVDC; 5.7 VDC Surge @ 125°V							
4,500	A1	TMX458*008P0A1	5.7	15	60	.13	6.0
6,000	A2	TMX608*008P0A2	7.6	20	80	.10	5.0
7,500	A3	TMX758*008P0A3	9.5	25	100	.08	4.0
9,000	A4	TMX908*008P0A4	11.4	30	120	.067	3.0
10,800	B1	TMX1088*008P0B1	13.8	42	150	.075	1.15
12,000	A5	TMX129*008P0A5	15.2	40	160	.05	2.5
14,400	B2	TMX1448*008P0B2	18.4	56	200	.056	.87
18,000	B3	TMX189*008P0B3	23.0	70	250	.045	.70
21,600	B4	TMX2168*008P0B4	27.6	84	300	.037	.58
25,200	B5	TMX2528*008P0B5	32.2	98	350	.032	.50
28,800	B6	TMX2888*008P0B6	36.8	112	400	.028	.43
32,400	B7	TMX3248*008P0B7	41.2	126	450	.025	.39
10 WVDC; 11.5 VDC Surge @ 85°C 7 WVDC; 8 VDC Surge @ 125°C							
3,600	A1	TMX368*010P0A1	5.5	15	60	.13	6.0
4,800	A2	TMX488*010P0A2	7.4	20	80	.10	5.0
6,000	A3	TMX608*010P0A3	9.25	25	100	.08	4.0
7,200	A4	TMX728*010P0A4	11.1	30	120	.067	3.0
9,000	B1	TMX908*010P0B1	13.8	42	150	.075	1.25
9,600	A5	TMX968*010P0A5	14.8	40	160	.05	2.5
12,000	B2	TMX129*010P0B2	18.4	56	200	.056	.93
15,000	B3	TMX159*010P0B3	23.0	70	250	.045	.75
18,000	B4	TMX189*010P0B4	27.6	84	300	.037	.62
21,000	B5	TMX219*010P0B5	32.2	98	350	.032	.53
24,000	B6	TMX249*010P0B6	36.8	112	400	.028	.47
27,000	B7	TMX279*010P0B7	41.4	126	450	.025	.42
15 WVDC; 17.2 VDC Surge @ 85°C 10 WVDC; 11.5 VDC Surge @ 125°C							
2,500	A1	TMX258*015P0A1	5.4	18	72	.13	8.0
3,300	A2	TMX338*015P0A2	7.2	24	96	.10	6.0
4,100	A3	TMX418*015P0A3	9.0	30	120	.08	5.0
4,900	A4	TMX498*015P0A4	10.8	36	144	.069	4.0
6,000	B1	TMX608*015P0B1	13.8	48	192	.092	1.42
6,600	A5	TMX668*015P0A5	14.4	48	192	.051	3.0
8,000	B2	TMX808*015P0B2	18.4	64	256	.069	1.06
10,000	B3	TMX109*015P0B3	23.0	80	320	.055	.85
12,000	B4	TMX129*015P0B4	27.6	96	384	.046	.71
14,000	B5	TMX149*015P0B5	32.2	112	448	.039	.61
16,000	B6	TMX169*015P0B6	36.8	128	512	.034	.53
18,000	B7	TMX189*015P0B7	41.4	144	576	.03	.47

Cap µF	Case Code	Catalog Number	Max 85°C 40 kHz Ripple (Amps rms)	DC Leakage µA (max) +25°C	DC Leakage µA (max) +85°C & +125°C	Max ESR Ω +25°C	Max Z @ -55°C Ω
25 WVDC; 28.8 VDC Surge @ 85°C 15 WVDC; 17.2 VDC Surge @ 125°C							
1,700	A1	TMX178*025P0A1	5.25	21	84	.17	8.0
2,200	A2	TMX228*025P0A2	7.0	28	112	.13	6.0
2,800	A3	TMX288*025P0A3	8.75	35	140	.10	5.0
3,400	A4	TMX348*025P0A4	10.5	42	168	.085	4.0
4,000	B1	TMX408*025P0B1	12.6	48	192	.092	1.58
4,500	A5	TMX458*025P0A5	14.0	56	224	.064	3.0
5,400	B2	TMX548*025P0B2	16.8	64	256	.069	1.19
6,800	B3	TMX688*025P0B3	21.0	80	320	.055	.95
8,100	B4	TMX818*025P0B4	25.2	96	384	.046	.79
9,500	B5	TMX958*025P0B5	29.4	112	448	.039	.68
10,900	B6	TMX1098*025P0B6	33.6	128	512	.034	.59
12,200	B7	TMX1228*025P0B7	37.8	144	576	.03	.53
30 WVDC; 34.5 VDC Surge @ 85°C 20 WVDC; 23 VDC Surge @ 125°C							
1,400	A1	TMX148*030P0A1	4.5	24	96	.15	9.0
1,900	A2	TMX198*030P0A2	6.0	32	128	.11	7.0
2,300	A3	TMX238*030P0A3	7.5	40	160	.094	6.0
2,800	A4	TMX288*030P0A4	9.0	48	192	.077	5.0
3,300	B1	TMX338*030P0B1	12.0	54	216	.092	1.67
3,800	A5	TMX388*030P0A5	12.0	64	256	.057	3.5
4,500	B2	TMX458*030P0B2	16.0	72	288	.069	1.25
5,600	B3	TMX568*030P0B3	20.0	90	360	.055	1.0
6,700	B4	TMX678*030P0B4	24.0	108	432	.046	.83
7,800	B5	TMX788*030P0B5	28.0	126	504	.039	.71
8,900	B6	TMX898*030P0B6	32.0	144	576	.034	.62
10,000	B7	TMX109*030P0B7	36.0	162	648	.03	.55
50 WVDC; 57.5 VDC Surge @ 85°C 30 WVDC; 34.5 VDC Surge @ 125°C							
800	A1	TMX807*050P0A1	4.35	24	96	.22	10.0
1,100	A2	TMX118*050P0A2	5.8	32	128	.16	8.0
1,300	A3	TMX138*050P0A3	7.25	40	160	.14	7.0
1,600	A4	TMX168*050P0A4	8.7	48	192	.11	5.0
2,000	B1	TMX208*050P0B1	11.4	54	216	.11	1.83
2,200	A5	TMX228*050P0A5	11.6	64	256	.082	4.0
2,600	B2	TMX268*050P0B2	15.2	72	288	.081	1.37
3,300	B3	TMX338*050P0B3	19.0	90	360	.065	1.10
4,000	B4	TMX408*050P0B4	22.8	108	432	.054	.92
4,600	B5	TMX468*050P0B5	26.6	126	504	.046	.78
5,300	B6	TMX538*050P0B6	30.4	144	576	.041	.69
5,900	B7	TMX598*050P0B7	34.2	162	648	.036	.61
60 WVDC; 69 VDC Surge @ 85°C 40 WVDC; 46 VDC Surge @ 125°C							
660	A1	TMX667*060P0A1	4.2	24	96	.22	10.0
880	A2	TMX887*060P0A2	5.6	32	128	.16	8.0
1,100	A3	TMX118*060P0A3	7.0	40	160	.13	6.0
1,300	A4	TMX138*060P0A4	8.4	48	192	.11	5.0
1,600	B1	TMX168*060P0B1	11.1	54	216	.10	1.92
1,800	A5	TMX188*060P0A5	11.2	64	256	.08	4.0
2,200	B2	TMX228*060P0B2	14.8	72	288	.075	1.44
2,700	B3	TMX278*060P0B3	18.5	90	360	.06	1.15
3,200	B4	TMX328*060P0B4	22.2	108	432	.05	.96
3,800	B5	TMX388*060P0B5	25.9	126	504	.043	.82
4,300	B6	TMX438*060P0B6	29.6	144	576	.038	.72
4,900	B7	TMX498*060P0B7	33.3	162	648	.033	.64

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%

Type TMX - All-Tantalum Module
Wet Tantalum Capacitors

MALLORY

Cap µF	Case Code	Catalog Number	Max 85°C 40 kHz Ripple (Amps rms)	DC Leakage µA (max) +25°C	DC Leakage µA (max) +85°C & +125°C	Max ESR Ω +25°C	Max Z @ -55°C Ω
75 WVDC; 86.2 VDC Surge @ 85°C 50 WVDC; 57.5 VDC Surge @ 125°C							
540	A1	TMX547*075P0A1	3.9	27	108	.26	10.0
720	A2	TMX727*075P0A2	5.2	36	144	.20	8.0
900	A3	TMX907*075P0A3	6.5	45	180	.16	7.0
1,100	A4	TMX118*075P0A4	7.8	54	216	.13	5.0
1,300	B1	TMX138*075P0B1	10.8	60	240	.13	2.0
1,400	A5	TMX148*075P0A5	10.4	72	288	.10	4.0
1,800	B2	TMX188*075P0B2	14.4	80	320	.10	1.5
2,200	B3	TMX228*075P0B3	18.0	100	400	.08	1.2
2,600	B4	TMX268*075P0B4	21.6	120	480	.067	1.0
3,100	B5	TMX318*075P0B5	25.2	140	560	.057	.86
3,500	B6	TMX358*075P0B6	28.8	160	640	.05	.75
4,000	B7	TMX408*075P0B7	32.4	180	720	.044	.67
100 WVDC; 115 VDC Surge @ 85°C 65 WVDC; 74.8 VDC Surge @ 125°C							
200	A1	TMX207*100P0A1	4.8	30	120	.48	14.0
270	A2	TMX277*100P0A2	6.4	40	160	.35	10.0
340	A3	TMX347*100P0A3	8.0	50	200	.28	8.0
400	A4	TMX407*100P0A4	9.6	60	240	.24	7.0
540	A5	TMX547*100P0A5	12.8	90	320	.18	5.0
720	B1	TMX727*100P0B1	12.0	72	288	.15	2.5
960	B2	TMX967*100P0B2	16.0	96	384	.11	1.88
1,200	B3	TMX128*100P0B3	20.0	120	480	.09	1.5
1,400	B4	TMX148*100P0B4	24.0	144	576	.075	1.25
1,700	B5	TMX178*100P0B5	28.0	168	672	.064	1.07
1,900	B6	TMX198*100P0B6	32.0	192	768	.056	.94
2,200	B7	TMX228*100P0B7	36.0	216	864	.05	.83
125 WVDC; 144 VDC Surge @ 85°C 100 WVDC; 115 VDC Surge @ 125°C							
140	A1	TMX147*125P0A1	4.5	30	120	.51	17.0
190	A2	TMX197*125P0A2	6.0	40	160	.38	13.0
240	A3	TMX247*125P0A3	7.5	50	200	.30	10.0
280	A4	TMX287*125P0A4	9.0	60	240	.26	8.0
380	A5	TMX387*125P0A5	12.0	80	320	.19	6.0
500	B1	TMX507*125P0B1	11.4	72	288	.16	5.3
660	B2	TMX667*125P0B2	15.2	96	384	.13	4.0
820	B3	TMX827*125P0B3	19.0	120	480	.10	3.2
980	B4	TMX987*125P0B4	22.8	144	576	.084	2.6
1,150	B5	TMX1157*125P0B5	26.6	168	672	.072	2.3
1,310	B6	TMX1317*125P0B6	30.4	192	768	.063	2.0
1,480	B7	TMX1487*125P0B7	34.2	216	864	.056	1.8

Cap µF	Case Code	Catalog Number	Max 85°C 40 kHz Ripple (Amps rms)	DC Leakage µA (max) +25°C	DC Leakage µA (max) +85°C & +125°C	Max ESR Ω +25°C	Max Z @ -55°C Ω
150 WVDC; 172 VDC Surge @ 85°C 100 WVDC; 115 VDC Surge @ 125°C							
90	A1	TMX906*150P0A1	1.3	10	40	1.60	60.0
180	A2	TMX187*150P0A2	2.6	18	72	.80	30.0
220	A3	TMX227*150P0A3	3.6	20	80	.65	24.0
270	A4	TMX277*150P0A4	3.9	27	108	.53	20.0
330	B1	TMX337*150P0B1	5.4	30	120	.53	8.0
360	A5	TMX367*150P0A5	5.2	36	144	.40	15.0
440	B2	TMX447*150P0B2	7.2	40	160	.40	6.0
550	B3	TMX557*150P0B3	9.0	50	200	.32	4.8
660	B4	TMX667*150P0B4	10.8	60	240	.27	4.0
770	B5	TMX777*150P0B5	12.6	70	280	.23	3.4
880	B6	TMX887*150P0B6	14.4	80	320	.20	3.0
990	B7	TMX997*150P0B7	16.2	90	360	.18	2.7
200 WVDC; 230 VDC Surge @ 85°C 130 WVDC; 149 VDC Surge @ 125°C							
35	A1	TMX356*200P0A1	1.6	10	40	2.50	40.0
70	A2	TMX706*200P0A2	3.2	20	80	1.25	20.0
100	A3	TMX107*200P0A3	4.8	30	120	.85	15.0
120	A4	TMX127*200P0A4	4.0	24	96	.90	15.0
140	A5	TMX147*200P0A5	6.4	40	160	.65	10.0
180	B1	TMX187*200P0B1	6.0	36	144	.60	10.0
240	B2	TMX247*200P0B2	8.0	48	192	.45	7.5
300	B3	TMX307*200P0B3	10.0	60	240	.36	6.0
360	B4	TMX367*200P0B4	12.0	72	288	.30	5.0
420	B5	TMX427*200P0B5	14.0	84	336	.25	4.3
480	B6	TMX487*200P0B6	16.0	96	384	.23	3.75
540	B7	TMX547*200P0B7	18.0	108	432	.20	3.3
250 WVDC; 288 VDC Surge @ 85°C 165 WVDC; 190 VDC Surge @ 125°C							
25	A1	TMX256*250P0A1	1.5	10	40	2.50	100.0
47	A2	TMX476*250P0A2	3.0	20	80	1.25	50.0
70	A3	TMX706*250P0A3	4.5	30	120	.85	32.0
80	A4	TMX806*250P0A4	3.8	24	96	1.00	32.0
90	A5	TMX906*250P0A5	6.0	40	160	.65	25.0
120	B1	TMX127*250P0B1	5.7	36	144	.67	21.0
160	B2	TMX167*250P0B2	7.6	48	192	.50	16.0
200	B3	TMX207*250P0B3	9.5	60	240	.40	12.8
240	B4	TMX247*250P0B4	11.4	72	288	.33	10.7
280	B5	TMX287*250P0B5	13.3	84	336	.29	9.1
320	B6	TMX327*250P0B6	15.2	96	384	.25	8.0
360	B7	TMX367*250P0B7	17.1	108	432	.22	7.1

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

CL55 (MIL-C-3965/21)
Wet Tantalum Capacitors

- High Capacitance Per Case SIze
- Hermetic Seal
- Wide Operating Temperature Range
- Temperature & Life Stability
- Low DCL
- Long Shelf Life

GENERAL SPECIFICATIONS

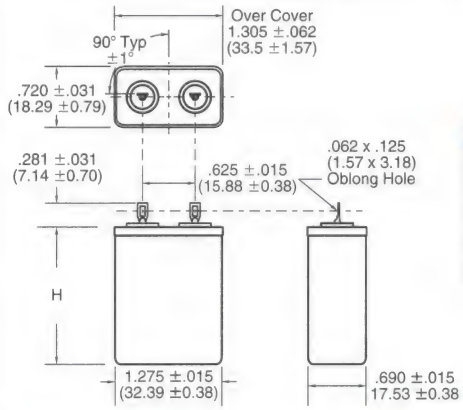
Operating Temperature:
-55°C to +125°C
with voltage derating

Voltage Range:
15 to 150 VDC @ 85°C
10 to 100 VDC @ 125°C

Capacitance:
70 μF to 2,400 μF

Tolerance Range:
±20%

The CL55 capacitor is a module consisting of several TLS wet slug, all-tantalum units wired in parallel, insulated and mounted in a rectangular metal case.
The case is potted with a compound that provides excellent thermal conductivity, high heat performance, increased shock resistance and improved coefficient of thermal expansion.
The assembly leads are brought out through glass-to-metal hermetic seals on the cover and the cover is soldered to the container.



A Case

H Dimensions		
Case Code	Inches ±.031	(mm) ±0.79
A1	1.062	26.97
A2	1.375	34.93
A3	1.625	41.28
A4	2.000	50.80
A5	2.500	63.50

Part Number Nomenclature

CL55	B	E	271	M	P	G
(1)	(2)	(3)	(4)	(5)	(6)	(7)

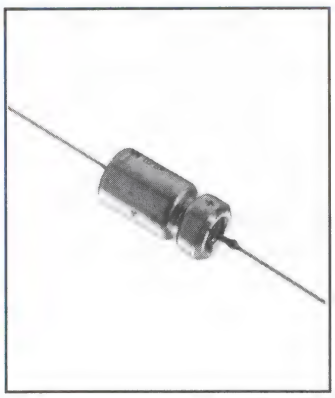
1. CL55 Series - Silver Case/Mylar Sleeve
2. Operating Temperature Code:
   B = -55°C to +85°C
3. Voltage Code @ 85°C: E = 15 H = 30 J = 50
   L = 75 N = 100 Q = 150
4. Capacitance Code (Expressed in Microfarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 271 = 270μF)
5. Capacitance Tolerance:
   M = ±20%
6. P = Polarized
7. Seal Code: G = Hermetic

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max DF + 25°C	Max Z Ω -55°C
15 WVDC; 17.2 VDC Surge @ 85°C 10 WVDC; 11.5 VDC Surge @ 125°C						
960	A1	CL55BE961MPG	7	58	15	3.1
1,200	A2	CL55BE122MPG	9	72	15	2.3
1,400	A3	CL55BE142MPG	11	84	15	1.7
2,100	A4	CL55BE212MPG	16	126	15	1.3
2,400	A5	CL55BE242MPG	18	144	15	1.2
30 WVDC; 34.5 VDC Surge @ 85°C 20 WVDC; 23.0 VDC Surge @ 125°C						
520	A1	CL55BH521MPG	8	63	15	5.3
660	A2	CL55BH661MPG	10	80	15	4.2
820	A3	CL55BH821MPG	13	99	15	2.9
1,200	A4	CL55BH122MPG	18	144	15	2.3
1,300	A5	CL55BH132MPG	20	156	15	2.1
50 WVDC; 57.5 VDC Surge @ 85°C 30 WVDC; 34.5 VDC Surge @ 125°C						
400	A1	CL55BJ401MPG	10	80	15	7.2
500	A2	CL55BJ501MPG	13	100	15	5.6
600	A3	CL55BJ601MPG	15	120	15	4.1
800	A4	CL55BJ801MPG	20	160	15	3.1
1,000	A5	CL55BJ102MPG	23	180	15	2.8

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max DF + 25°C	Max Z Ω -55°C
75 WVDC; 86.2 VDC Surge @ 85°C 50 WVDC; 57.5 VDC Surge @ 125°C						
270	A1	CL55BL271MPG	9	81	12	8.5
330	A2	CL55BL331MPG	12	91	12	7.0
400	A3	CL55BL401MPG	15	119	12	5.0
600	A4	CL55BL601MPG	23	180	12	3.7
660	A5	CL55BL661MPG	25	198	12	3.5
100 WVDC; 115.0 VDC Surge @ 85°C 65 WVDC; 74.8 VDC Surge @ 125°C						
170	A1	CL55BN171MPG	9	68	12	15.0
220	A2	CL55BN221MPG	11	88	12	11.6
260	A3	CL55BN261MPG	13	104	12	8.0
350	A4	CL55BN351MPG	18	140	12	6.5
440	A5	CL55BN441MPG	22	176	12	5.8
150 WVDC; 172.0 VDC Surge @ 85°C 100 WVDC; 115.0 VDC Surge @ 125°C						
70	A1	CL55BQ700MPG	6	42	12	28.8
90	A2	CL55BQ900MPG	7	54	12	22.4
100	A3	CL55BQ101MPG	8	60	12	16.4
140	A4	CL55BQ141MPG	11	84	12	12.4
180	A5	CL55BQ181MPG	14	104	12	11.2

CL65 (MIL-C-3965/4)
Wet Tantalum Capacitors

MALLORY



- High Capacitance Per Case SIze
- Extremely Low DCL
- Long Operating Life
- Rugged Mechanical Construction
- Wide Operating Temperature Range

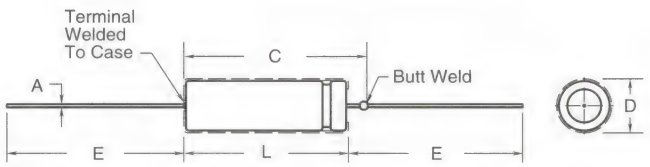
GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
with voltage derating

Voltage Range:
6 to 125 VDC @ 85°C
4 to 85 VDC @ 125°C

Capacitance:
1.7 μF to 560 μF

Tolerance Range:
±10%, ±20%
(±5% on special order)



Part Number Nomenclature

CL65	B	E	271	M	P	E
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. CL65 Series - Silver Case/Mylar Sleeve
   CL64 Series - Silver Case/Uninsulated
2. Operating Temperature Code:
   B = -55°C to +85°C
3. Voltage Code @ 85°C: B = 6 C = 8 D = 10 E = 15
   G = 25 H = 30 J = 50 K = 60
   L = 75 N = 100 P = 125
4. Capacitance Code (Expressed in Microfarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 271 = 270μF)
5. Capacitance Tolerance:
   M = ±20%, K = ±10%, J = ±5%
6. P = Polarized
7. Seal & Vibration Code: E = 10 to 2000 cps

DIMENSIONS

Case Code	INCHES D Max	L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)	Case Code	MILLIMETERS D Max	L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±6.35
T1	.219	.608	.734	.025	#22	1.500	1.4	T1	5.56	15.45	18.64	.64	#22	38.10
T2	.312	.796	.922	.025	#22	2.250	3.0	T2	7.92	20.22	23.41	.64	#22	57.15
T3	.4062	.921	1.047	.025	#22	2.250	5.6	T3	10.31	23.40	26.59	.64	#22	57.15

6 WVDC; 6.9 VDC Surge @ 85°C
4 WVDC; 4.7 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max DF +25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
30	T1	CL65BB300*PE	1	2	9.1	100	-40	+10.5	+12
68	T1	CL65BB680*PE	1	2	20.4	60	-40	+14	+16
140	T2	CL65BB141*PE	1	3	21.3	40	-40	+!4	+16
270	T2	CL65BB271*PE	1	6.5	81.8	25	-44	+17.5	+20
330	T3	CL65BB331*PE	2	7.9	49.6	20	-44	+14	+16
560	T3	CL65BB561*PE	2	13	128	25	-64	+17.5	+20

8 WVDC; 9.2 VDC Surge @ 85°C
5 WVDC; 5.7 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max DF +25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
25	T1	CL65BC250*PE	1	2	7.6	100	-40	+10.5	+12
56	T1	CL65BC560*PE	1	2	17	59	-40	+14	+16
220	T2	CL65BC221*PE	1	7	66.4	30	-44	+17.5	+20
430	T3	CL65BC431*PE	2	14	91.5	25	-64	+17.5	+20

10 WVDC; 11.5 VDC Surge @ 85°C
7 WVDC; 8 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max DF +25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
20	T1	CL65BD200*PE	1	2	6.1	175	-32	+10.5	+12
47	T1	CL65BD470*PE	1	2	18.1	100	-36	+14	+16
100	T2	CL65BD101*PE	1	4	15.2	60	-36	+14	+16
180	T2	CL65BD181*PE	1	7	54.4	40	-36	+14	+16
250	T3	CL65BD251*PE	2	10	37.8	30	-40	+14	+16
390	T3	CL65BD391*PE	2	16	87.6	25	-64	+17.5	+20

15 WVDC; 17.2 VDC Surge @ 85°C
10 WVDC; 11.5 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max DF +25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
15	T1	CL65BE150*PE	1	2	5.7	155	-24	+10.5	+12
33	T1	CL65BE330*PE	1	2	12.5	90	-28	+14	+16
70	T2	CL65BE700*PE	1	4	13.1	75	-28	+14	+16
120	T2	CL65BE121*PE	1	7	36.8	50	-28	+17.5	+20
170	T3	CL65BE171*PE	2	10	25.4	35	-32	+14	+16
270	T3	CL65BE271*PE	2	16	60.9	30	-56	+17.5	+20

25 WVDC; 28.8 VDC Surge @ 85°C
15 WVDC; 17.2 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max DF +25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
10	T1	CL65BG100*PE	1	2	4.6	220	-16	+8	+9
22	T1	CL65BG220*PE	1	2	8.3	140	-20	+10.5	+12
100	T2	CL65BG101*PE	1	10	31.5	50	-28	+13	+15
180	T3	CL65BG181*PE	2	18	54.3	32	-48	+13	+15

30 WVDC; 34.5 VDC Surge @ 85°C
20 WVDC; 23 VDC Surge @ 125°C

Cap μF	Case Code	Catalog Number	Max DCL μA 25°C	Max DCL μA 85°C/125°C	Max DF +25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	+85°C	+125°C
8	T1	CL65BH080*PE	1	2	4.5	275	-16	+8	+12
15	T1	CL65BH150*PE	1	2	9.1	175	-20	+10.5	+12
40	T2	CL65BH400*PE	1	5	12.2	65	-24	+10.5	+12
68	T2	CL65BH680*PE	1	8	31	60	-24	+13	+15
100	T3	CL65BH101*PE	2	12	19	40	-28	+10.5	+12
150	T3	CL65BH151*PE	2	18	46	35	-48	+13	+15

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%, J = ±5%

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Cap µF	Case Code	Catalog Number	Max DCL µA 25°C	Max DCL µA 85°C/125°C	Max DF + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	Max % Cap Change From 25°C +85°C	Max % Cap Change From 25°C +125°C
50 WVDC; 57.5 VDC Surge @ 85°C 30 WVDC; 34.5 VDC Surge @ 125°C									
5	T1	CL65BJ050*PE	1	2	3.4	400	-16	+5	+6
10	T1	CL65BJ100*PE	1	2	6	250	-24	+8	+9
25	T2	CL65BJ250*PE	1	5	11.2	95	-20	+10.5	+12
47	T2	CL65BJ470*PE	1	9	21.4	70	-28	+13	+15
60	T3	CL65BJ600*PE	2	12	13.6	45	-16	+10.5	+12
82	T3	CL65BJ820*PE	2	16	24.9	45	-32	+13	+15
60 WVDC; 69 VDC Surge @ 85°C 40 WVDC; 46 VDC Surge @ 125°C									
4	T1	CL65BK040*PE	1	2	3	550	-16	+5	+6
8.2	T1	CL65BK8R2*PE	1	2	5	275	-24	+8	+9
20	T2	CL65BK200*PE	1	5	7.6	105	-16	+10.5	+12
39	T2	CL65BK390*PE	1	9	20.7	90	-24	+10.5	+12
50	T3	CL65BK500*PE	2	12	15.3	50	-16	+10.5	+12
68	T3	CL65BK680*PE	2	16	30.7	50	-32	+10.5	+12
75 WVDC; 86.2 VDC Surge @ 85°C 50 WVDC; 57.5 VDC Surge @ 125°C									
3.5	T1	CL65BL3R5*PE	1	2	2.5	650	-16	+5	+6
6.8	T1	CL65BL6R8*PE	1	2	4.1	300	-20	+8	+9
15	T2	CL65BL150*PE	1	5	7.5	150	-16	+8	+9
33	T2	CL65BL330*PE	1	10	17.5	90	-24	+10.5	+15
40	T3	CL65BL400*PE	2	12	15.2	60	-16	+10.5	+12
56	T3	CL65BL560*PE	2	17	26	60	-28	+10.5	+15

Cap µF	Case Code	Catalog Number	Max DCL µA 25°C	Max DCL µA 85°C/125°C	Max DF + 25°C	Max Z Ω -55°C	Max % Cap Change From 25°C -55°C	Max % Cap Change From 25°C +85°C	Max % Cap Change From 25°C +125°C
100 WVDC; 115 VDC Surge @ 85°C 65 WVDC; 74.8 VDC Surge @ 125°C									
2.5	T1	CL65BN2R5*PE	1	2	5	950	-16	+7	+8
4.7	T1	CL65BN4R7*PE	1	2	3.6	500	-16	+7	+8
11	T2	CL65BN110*PE	1	4	5	200	-16	+7	+8
22	T2	CL65BN220*PE	1	9	11.8	100	-16	+7	+8
30	T3	CL65BN300*PE	2	12	9.1	80	-16	+7	+8
43	T3	CL65BN430*PE	2	17	10.7	70	-20	+7	+8
125 WVDC;144 VDC Surge @ 85°C 85 WVDC; 97.8 VDC Surge @ 125°C									
1.7	T1	CL65BP1R7*PE	1	2	7	1250	-16	+7	+8
3.6	T1	CL65BP3R6*PE	1	2	4.1	600	-16	+7	+8
9	T2	CL65BP090*PE	1	5	10.2	240	-16	+7	+8
14	T2	CL65BP140*PE	1	7	12.7	167	-16	+7	+8
25	T3	CL65BP250*PE	2	13	19	93	-16	+7	+8

* Insert Proper Letter Code For Tolerance: M = ±20%, K = ±10%, J = ±5%

CLR10 (MIL-C-39006/18)
Wet Tantalum Capacitors

MALLORY

- High Temperature
- High Voltage
- High Capacitance
- Withstands High Frequency Vibration to 2000 Hz
- Hermetically Sealed
- Long Shelf Life
- Failure Rate Levels L, M and P

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
with voltage derating

Voltage Range:
8 to 360 VDC @ 85°C

Reverse Voltage:
None

Capacitance Range:
2 μF to 140 μF

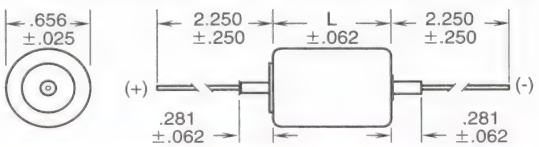
Tolerance Range:
-15 +50%

$$ESR = \frac{10{,}000 \times DF}{6.28 \times f \times \mu F}$$

DF = Dissipation Factor %
f = Frequency in Hz

Case Sizes:

Diam	Lgth
.656	.438 to 1.781



Capacitance (µF)	Maximum Working Voltage +85°C	Maximum Working Voltage +125°C	Surge Voltage @ +85°C	Part Number MIL-C-39006/18 Failure Rate Level (% / 1000 Hrs) L (2.0)	M (1.0)	P (0.1)	Max DF (%)	Max Z -55°C (Ohms)	Maximum DC Leakage (µA) +25°C	+85°C	+125°C	Maximum % Capacitance Change from Room Temperature -55°C	Dimension L ±.062
70	8	7	9.2	1000	1018	1036	47	60	6	30	48	-60	.438
140	8	7	9.2	1001	1019	1037	47	30	10	50	80	-60	.562
50	10	9	11.5	1002	1020	1038	35	75	5	25	40	-60	.438
100	10	9	11.5	1003	1021	1039	35	40	9	45	72	-60	.562
28	20	18	23	1004	1022	1040	21	85	6	30	48	-60	.438
56	20	18	23	1005	1023	1041	21	45	10	50	80	-60	.562
20	30	26	34.5	1006	1024	1042	15	125	7	35	56	-40	.438
40	30	26	34.5	1007	1025	1043	15	75	12	60	96	-40	.562
12	60	52	69	1008	1026	1044	9.1	180	7	35	56	-30	.438
25	60	52	69	1009	1027	1045	9.6	90	12	60	96	-30	.562
8	90	78	103	1010	1028	1046	6.1	250	7	35	56	-30	.438
16	90	78	103	1011	1029	1047	6.1	125	12	60	96	-30	.562
4	180	155	207	1012	1030	1048	6.1	500	7	35	56	-30	.719
8	180	155	207	1013	1031	1049	6.1	250	12	60	96	-30	.938
2.5	270	235	310	1014	1032	1050	5.7	750	7	35	56	-30	1.031
5	270	235	310	1015	1033	1051	5.7	375	11	55	88	-30	1.375
2	360	310	414	1016	1034	1052	6.1	1000	7	35	56	-30	1.312
4	360	310	414	1017	1035	1053	6.1	500	12	60	96	-30	1.781

TO ORDER: **Indicate the prefix M39006/18 followed by the applicable MIL dash number**
Example: For M39006/18-1036 order M39006/181036

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

CLR14 (MIL-C-39006/19)
Wet Tantalum Capacitors

- High Temperature
- High Voltage
- High Capacitance
- Withstands High Frequency Vibration to 2000 Hz
- Hermetically Sealed
- Long Shelf Life
- Failure Rate Levels L, M and P

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
with voltage derating

Voltage Range:
20 to 630 VDC @ 85°C

Reverse Voltage:
None

Capacitance Range:
3.5 μF to 200 μF

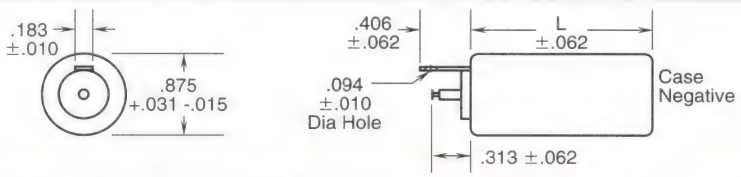
Tolerance Range:
-15 +75%

$$ESR = \frac{10{,}000 \times DF}{6.28 \times f \times \mu F}$$

DF = Dissipation Factor %
f = Frequency in Hz

Case Sizes:

Diam	Lgth
.875	.540 to 4.062



Capacitance (µF)	Maximum Working Voltage		Surge Voltage @	Part Number MIL-C-39006/18 Failure Rate Level (% / 1000 Hrs)			Max DF	Max Z -55°C	Maximum DC Leakage (µA)			Maximum % Capacitance Change from Room Temperature	Dimension L
	+85°C	+125°C	+85°C	L (2.0)	M (1.0)	P (0.1)	(%)	(Ohms)	+25°C	+85°C	+125°C	-55°C	±.062
100	20	18	23	1000	1020	1040	21	30	10	50	80	-60	.540
200	20	18	23	1001	1021	1041	36	20	16	80	128	-60	.732
75	30	26	34.5	1002	1022	1042	15	45	11	55	88	-45	.540
150	30	26	34.5	1003	1023	1043	29	30	13	90	104	-45	.732
40	60	52	69	1004	1024	1044	8.2	65	12	60	96	-35	.540
80	60	52	69	1005	1025	1045	16	35	19	95	152	-35	.732
25	90	78	103	1006	1026	1046	5.1	90	11	55	88	-35	.540
50	90	78	103	1007	1027	1047	10	45	18	90	144	-35	.732
12	180	155	207	1008	1028	1048	5.1	180	11	55	88	-35	.920
25	180	155	207	1009	1029	1049	10	90	18	90	144	-35	1.300
8	270	235	310	1010	1030	1050	5.1	270	11	55	88	-35	1.270
16	270	235	310	1011	1031	1051	10	135	18	90	144	-35	1.865
6	360	310	414	1012	1032	1052	5	360	11	55	88	-35	1.635
12	360	310	414	1013	1033	1053	10	180	18	90	144	-35	2.420
5.0	450	390	518	1014	1034	1054	4.9	450	11	55	88	-35	2.000
10	450	390	518	1015	1035	1055	9.8	225	18	90	144	-35	2.980
4.0	540	470	621	1016	1036	1056	5.1	540	11	55	88	-35	2.365
8.0	540	470	621	1017	1037	1057	10	270	18	90	144	-35	3.532
3.5	630	545	724	1018	1038	1058	5	630	11	55	88	-35	2.720
7.0	630	545	724	1019	1039	1059	10	315	18	90	144	-35	4.062

TO ORDER: **Indicate the prefix M39006/19 followed by the applicable MIL dash number**
Example: For M39006/19-1030 order M39006/191030

CLR17 (MIL-C-39006/20)
Wet Tantalum Capacitors

MALLORY

- High Temperature
- High Voltage
- High Capacitance
- Withstands High Frequency Vibration to 2000 Hz
- Hermetically Sealed
- Long Shelf Life
- Failure Rate Levels L, M and P

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
with voltage derating

Voltage Range:
30 to 630 VDC @ 85°C

Reverse Voltage:
None

Capacitance Range:
12 μF to 1300 μF

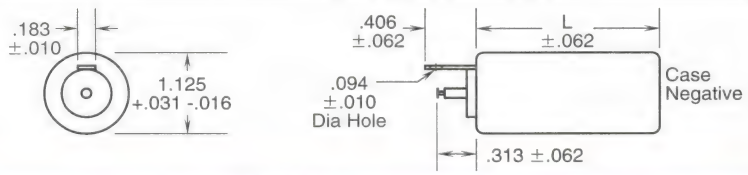
Tolerance Ranges:
±20%
-15 +50%

$$ESR = \frac{10{,}000 \times DF}{6.28 \times f \times \mu F}$$

DF = Dissipation Factor %
f = Frequency in Hz

Case Sizes:

Diam	Lgth
1.125	.600 to 2.812



Cap (μF)	Cap Tol	Maximum Working Voltage +85°C	Maximum Working Voltage +125°C	Surge Voltage @ +85°C	Part Number MIL-C-39006/20 Failure Rate Level (% / 1000 Hrs) L (2.0)	M (1.0)	P (0.1)	Max DF (%)	Max Z -55°C (Ohms)	Maximum DC Leakage (μA) +25°C	+85°C	+125°C	Maximum % Capacitance Change from Room Temperature -55°C	Dimension L ±.062
370	±20	30	26	34.5	1000	1050	1100	39	15	18	125	180	-65	.600
370	-15+50	30	26	34.5	1001	1051	1101	39	15	18	125	180	-65	.600
650	±20	30	26	34.5	1002	1052	1102	60	15	21	145	210	-85	1.100
650	-15+50	30	26	34.5	1003	1053	1103	60	15	21	145	210	-85	1.100
1300	±20	30	26	34.5	1004	1054	1104	83	10	27	190	270	-85	1.100
1300	-15+50	30	26	34.5	1005	1055	1105	83	10	27	190	270	-85	1.100
200	±20	60	52	69	1006	1056	1106	22	30	19	135	190	-50	.600
200	-15+50	60	52	69	1007	1057	1107	22	30	19	135	190	-50	.600
350	±20	60	52	69	1008	1058	1108	37	25	22	155	220	-70	1.100
350	-15+50	60	52	69	1009	1059	1109	37	25	22	155	220	-70	1.100
700	±20	60	52	69	1010	1060	1110	62	15	29	200	290	-70	1.100
700	-15+50	60	52	69	1011	1061	1111	62	15	29	200	290	-70	1.100
120	±20	90	78	103	1012	1062	1112	13	40	19	135	190	-40	.600
120	-15+50	90	78	103	1013	1063	1113	13	40	19	135	190	-40	.600
220	±20	90	78	103	1014	1064	1114	24	30	21	145	210	-60	1.100
220	-15+50	90	78	103	1015	1065	1115	24	30	21	145	210	-60	1.100
450	±20	90	78	103	1016	1066	1116	45	25	29	195	290	-60	1.100
450	-15+50	90	78	103	1017	1067	1117	45	25	29	195	290	-60	1.100
42	±20	180	155	207	1018	1068	1118	16	75	17	120	170	-40	.976
42	-15+50	180	155	207	1019	1069	1119	16	75	17	120	170	-40	.976
60	±20	180	155	207	1020	1070	1120	13	60	19	135	190	-40	.976
60	-15+50	180	155	207	1021	1071	1121	13	60	19	135	190	-40	.976
110	±20	180	155	207	1022	1072	1122	24	60	21	145	210	-60	1.938
110	-15+50	180	155	207	1023	1073	1123	24	60	21	145	210	-60	1.938
230	±20	180	155	207	1024	1074	1124	46	50	29	200	290	-60	1.938
230	-15+50	180	155	207	1025	1075	1125	46	50	29	200	290	-60	1.938
28	±20	270	235	310	1026	1076	1126	16	80	19	120	190	-40	1.350
28	-15+50	270	235	310	1027	1077	1127	16	80	19	120	190	-40	1.350
40	±20	270	235	310	1028	1078	1128	22	100	19	135	190	-40	1.350
40	-15+50	270	235	310	1029	1079	1129	22	100	19	135	190	-40	1.350
75	±20	270	235	310	1030	1080	1130	24	90	21	145	210	-60	2.812
75	-15+50	270	235	310	1031	1081	1131	24	90	21	145	210	-60	2.812
150	±20	270	235	310	1032	1082	1132	45	75	28	195	280	-60	2.812
150	-15+50	270	235	310	1033	1083	1133	45	75	28	195	280	-60	2.812
22	±20	360	310	414	1034	1084	1134	16	100	18	125	180	-40	1.705
22	-15+50	360	310	414	1035	1085	1135	16	100	18	125	180	-40	1.705

TO ORDER: **Indicate the prefix M39006/20 followed by the applicable MIL dash number**
Example: For M39006/20-1076 order M39006/201076

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

CLR17 (MIL-C-39006/20)
Wet Tantalum Capacitors

MALLORY

Cap (μF)	Cap Tol	Maximum Working Voltage		Surge Voltage @	Part Number MIL-C-39006/20 Failure Rate Level (% / 1000 Hrs)			Max DF	Max Z -55°C	Maximum DC Leakage (μA)			Maximum % Capacitance Change from Room Temperature	Dimension L
		+85°C	+125°C	+85°C	L (2.0)	M (1.0)	P (0.1)	(%)	(Ohms)	+25°C	+85°C	+125°C	-55°C	±.062
30	±20	360	310	414	1036	1086	1136	22	120	19	135	190	-40	1.705
30	-15+50	360	310	414	1037	1087	1137	22	120	19	135	190	-40	1.705
17	±20	450	390	518	1038	1088	1138	16	130	18	125	180	-40	2.080
17	-15+50	450	390	518	1039	1089	1139	16	130	18	125	180	-40	2.080
25	±20	450	390	518	1040	1090	1140	23	150	19	135	190	-40	2.080
25	-15+50	450	390	518	1041	1091	1141	23	150	19	135	190	-40	2.080
14	±20	540	470	621	1042	1092	1142	16	160	17	120	170	-40	2.435
14	-15+50	540	470	621	1043	1093	1143	16	160	17	120	170	-40	2.435
20	±20	540	470	621	1044	1094	1144	22	170	19	135	190	-40	2.435
20	-15+50	540	470	621	1045	1095	1145	22	170	19	135	190	-40	2.435
12	±20	630	545	724	1046	1096	1146	16	180	17	120	170	-40	2.810
12	-15+50	630	545	724	1047	1097	1147	16	180	17	120	170	-40	2.810
18	±20	630	545	724	1048	1098	1148	23	200	19	135	190	-40	2.810
18	-15+50	630	545	724	1049	1099	1149	23	200	19	135	190	-40	2.810

TO ORDER: **Indicate the prefix M39006/20 followed by the applicable MIL dash number**
Example: For M39006/20-1076 order M39006/201076

CLR65 (MIL-C-39006/09)
Wet Tantalum Capacitors

MALLORY

- Silver Case Technology
- Hermetically Sealed
- Rugged Construction
- High Shock and Vibration Capability
- High Capacitance per Case Size
- Low DCL and ESR
- Long Shelf Life
- Failure Rate Levels M, P and R

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
with voltage derating

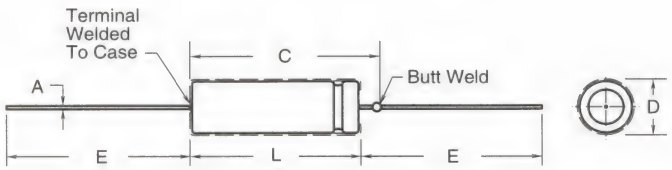
Voltage Range:
6 to 125 VDC

Capacitance Range:
1.7 μF to 1200 μF

Tolerance Range:
±10%, ±20%
(±5% by special order)

Case Sizes: (Four)
.188 x.453 to .375 x 1.062

Maximum rms Ripple Current @ 85°C	
Case Code	mA
A	50
B	250
C	500
F	750



DIMENSIONS

Case Code	INCHES Uninsulated D ±.016	L +.031, -.016	Insulated D Max	L Max	C Max	A Lead Dia Nom	AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)	Case Code	MILLIMETERS Uninsulated D ±.41	L +.79, -.41	Insulated D Max	L Max	C Max	A Lead Dia Nom	AWG	E Lead Lgth ±6.35
T1	.188	.453	.219	.608	.734	.025	#22	1.500	1.2	T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
T2	.281	.641	.312	.796	.922	.025	#22	2.250	3.1	T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
T3	.375	.766	.406	.921	1.047	.025	#22	2.250	5.8	T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	9.0	T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

Cap (μF)	Cap Tol (±)	Maximum Working Voltage +85°C	+125°C	Surge Voltage @ +85°C	Part Number MIL-C-39006/09 Failure Rate Level (% / 1000 Hrs.) M (1.0)	P (0.1)	R (0.01)	Max DF (%)	Max Z -55°C (Ohms)	Maximum DC Leakage (μA) +25°C	+85°C & +125°C	Maximum % Capacitance Change from Room Temperature -55°C	+85°C	+125°C	Case Code
30	20	6	4	6.9	8206	8411	8616	9.1	100	1	2	-40	+10.5	+12	T1
30	10	6	4	6.9	8207	8412	8617	9.1	100	1	2	-40	+10.5	+12	T1
68	20	6	4	6.9	8209	8414	8619	20.4	60	1	2	-40	+14	+16	T1
68	10	6	4	6.9	8210	8415	8620	20.4	60	1	2	-40	+14	+16	T1
140	20	6	4	6.9	8212	8417	8622	21.3	40	1	3	-40	+14	+16	T2
140	10	6	4	6.9	8213	8418	8623	21.3	40	1	3	-40	+14	+16	T2
270	20	6	4	6.9	8215	8420	8625	81.8	25	1	6.5	-40	+17.5	+20	T2
270	10	6	4	6.9	8216	8421	8626	81.8	25	1	6.5	-44	+17.5	+20	T2
330	20	6	4	6.9	8218	8423	8628	49.6	20	2	7.9	-44	+14	+16	T3
330	10	6	4	6.9	8219	8424	8629	49.6	20	2	7.9	-44	+14	+16	T3
560	20	6	4	6.9	8221	8426	8631	128	25	2	13	-64	+17.5	+20	T3
560	10	6	4	6.9	8222	8427	8632	128	25	2	13	-64	+17.5	+20	T3
1200	20	6	4	6.9	8224	8429	8634	144.4	20	3	14	-80	+25	+25	T4
1200	10	6	4	6.9	8225	8430	8635	144.4	20	3	14	-80	+25	+25	T4
25	20	8	5	9.2	8226	8431	8636	7.6	100	1	2	-40	+10.5	+12	T1
25	10	8	5	9.2	8227	8432	8637	7.6	100	1	2	-40	+10.5	+12	T1
56	20	8	5	9.2	8229	8434	8639	17	59	1	2	-40	+14	+16	T1
56	10	8	5	9.2	8230	8435	8640	17	59	1	2	-40	+14	+16	T1
220	20	8	5	9.2	8232	8437	8642	66.4	30	1	7	-44	+17.5	+20	T2
220	10	8	5	9.2	8233	8438	8643	66.4	30	1	7	-44	+17.5	+20	T2
430	20	8	5	9.2	8235	8440	8645	91.5	25	2	14	-64	+17.5	+20	T3
430	10	8	5	9.2	8236	8441	8646	91.5	25	2	14	-64	+17.5	+20	T3
850	20	8	5	9.2	8238	8443	8648	65.8	22	4	16	-80	+25	+25	T4
850	10	8	5	9.2	8239	8444	8649	65.8	22	4	16	-80	+25	+25	T4

TO ORDER: **Indicate the prefix M39006/09 followed by the applicable MIL dash number**
Example: For M39006/09-8210 order M39006/098210

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

CLR65 (MIL-C-39006/09)
Wet Tantalum Capacitors

MALLORY

Cap (µF)	Cap Tol (±)	Maximum Working Voltage		Surge Voltage @	Part Number MIL-C-39006/09 Failure Rate Level (% / 1000 Hrs.)			Max DF	Max Z -55°C	Maximum DC Leakage (µA)		Maximum % Capacitance Change from Room Temperature			Case Code
		+85°C	+125°C	+85°C	M (1.0)	P (0.1)	R (0.01)	(%)	(Ohms)	+25°C	+85°C & +125°C	-55°C	+85°C	+125°C	
20	20	10	7	11.5	8240	8445	8650	6.1	175	1	2	-32	+10.5	+12	T1
20	10	10	7	11.5	8241	8446	8651	6.1	175	1	2	-32	+10.5	+12	T1
47	20	10	7	11.5	8243	8448	8653	18.1	100	1	2	-36	+14	+16	T1
47	10	10	7	11.5	8244	8449	8654	18.1	100	1	2	-36	+14	+16	T1
100	20	10	7	11.5	8246	8451	8656	15.2	60	1	4	-36	+14	+16	T2
100	10	10	7	11.5	8247	8452	8657	15.2	60	1	4	-36	+14	+16	T2
180	20	10	7	11.5	8249	8454	8659	54.4	40	1	7	-36	+14	+16	T2
180	10	10	7	11.5	8250	8455	8660	54.4	40	1	7	-36	+14	+16	T2
250	20	10	7	11.5	8252	8457	8662	37.8	30	2	10	-40	+14	+16	T3
250	10	10	7	11.5	8253	8458	8663	37.8	30	2	10	-40	+14	+16	T3
390	20	10	7	11.5	8255	8460	8665	87.6	25	2	16	-64	+20	+20	T3
390	10	10	7	11.5	8256	8461	8666	87.6	25	2	16	-64	+20	+20	T3
750	20	10	7	11.5	8258	8463	8668	56.5	23	4	16	-80	+25	+25	T4
750	10	10	7	11.5	8259	8464	8669	56.5	23	4	16	-80	+25	+25	T4
15	20	15	10	17.2	8260	8465	8670	5.7	155	1	2	-24	+10.5	+12	T1
15	10	15	10	17.2	8261	8466	8671	5.7	155	1	2	-24	+10.5	+12	T1
33	20	15	10	17.2	8263	8468	8673	12.5	90	1	2	-28	+14	+16	T1
33	10	15	10	17.2	8264	8469	8674	12.5	90	1	2	-28	+14	+16	T1
70	20	15	10	17.2	8266	8471	8676	13.1	75	1	4	-28	+14	+16	T2
70	10	15	10	17.2	8267	8472	8677	13.1	75	1	4	-28	+14	+16	T2
120	20	15	10	17.2	8269	8474	8679	36.8	50	1	7	-28	+17.5	+20	T2
120	10	15	10	17.2	8270	8475	8680	36.8	50	1	7	-28	+17.5	+20	T2
170	20	15	10	17.2	8272	8477	8682	25.4	35	2	10	-32	+14	+16	T3
170	10	15	10	17.2	8273	8478	8683	25.4	35	2	10	-32	+14	+16	T3
270	20	15	10	17.2	8275	8480	8685	60.9	30	2	16	-56	+17.5	+20	T3
270	10	15	10	17.2	8276	8481	8686	60.9	30	2	16	-56	+17.5	+20	T3
540	20	15	10	17.2	8278	8483	8688	49	23	6	24	-80	+25	+25	T4
540	10	15	10	17.2	8279	8484	8689	49	23	6	24	-80	+25	+25	T4
10	20	25	15	28.8	8280	8485	8690	4.6	220	1	2	-16	+8	+9	T1
10	10	25	15	28.8	8281	8486	8691	4.6	220	1	2	-16	+8	+9	T1
22	20	25	15	28.8	8283	8488	8693	8.3	140	1	2	-20	+10.5	+15	T1
22	10	25	15	28.8	8284	8489	8694	8.3	140	1	2	-20	+10.5	+15	T1
100	20	25	15	28.8	8286	8491	8696	31.4	50	1	10	-28	+13	+15	T2
100	10	25	15	28.8	8287	8492	8697	31.4	50	1	10	-28	+13	+15	T2
180	20	25	15	28.8	8289	8494	8699	54.3	32	2	18	-48	+13	+15	T3
180	10	25	15	28.8	8290	8495	8700	54.3	32	2	18	-48	+13	+15	T3
350	20	25	15	28.8	8292	8497	8702	35	24	7	28	-70	+25	+25	T4
350	10	25	15	28.8	8293	8498	8703	35	24	7	28	-70	+25	+25	T4
8	20	30	20	34.5	8294	8499	8704	4.5	275	1	2	-16	+8	+12	T1
8	10	30	20	34.5	8295	8500	8705	4.5	275	1	2	-16	+8	+12	T1
15	20	30	20	34.5	8297	8502	8707	9.1	175	1	2	-20	+10.5	+12	T1
15	10	30	20	34.5	8298	8503	8708	9.1	175	1	2	-20	+10.5	+12	T1
40	20	30	20	34.5	8300	8505	8710	12.2	65	1	5	-24	+10.5	+12	T2
40	10	30	20	34.5	8301	8506	8711	12.2	65	1	5	-24	+10.5	+12	T2
68	20	30	20	34.5	8303	8508	8713	31	60	1	8	-24	+13	+15	T2
68	10	30	20	34.5	8304	8509	8714	31	60	1	8	-24	+13	+15	T2
100	20	30	20	34.5	8306	8511	8716	19	40	2	12	-28	+10.5	+12	T3
100	10	30	20	34.5	8307	8512	8717	19	40	2	12	-28	+10.5	+12	T3
150	20	30	20	34.5	8309	8514	8719	46	35	2	18	-48	+13	+15	T3
150	10	30	20	34.5	8310	8515	8720	46	35	2	18	-48	+13	+15	T3
300	20	30	20	34.5	8312	8517	8722	35	25	8	32	-60	+25	+25	T4
300	10	30	20	34.5	8313	8518	8723	35	25	8	32	-60	+25	+25	T4
5	20	50	30	57.5	8314	8519	8724	3.4	400	1	2	-16	+5	+6	T1
5	10	50	30	57.5	8315	8520	8725	3.4	400	1	2	-16	+5	+6	T1
10	20	50	30	57.5	8317	8522	8727	6	250	1	2	-24	+8	+9	T1
10	10	50	30	57.5	8318	8523	8728	6	250	1	2	-24	+8	+9	T1
25	20	50	30	57.5	8320	8525	8730	11.2	95	1	5	-20	+10.5	+12	T2
25	10	50	30	57.5	8321	8526	8731	11.2	95	1	5	-20	+10.5	+12	T2
47	20	50	30	57.5	8323	8528	8733	21.4	70	1	9	-28	+13	+15	T2
47	10	50	30	57.5	8324	8529	8734	21.4	70	1	9	-28	+13	+15	T2
60	20	50	30	57.5	8326	8531	8736	13.6	45	2	12	-16	+10.5	+12	T3
60	10	50	30	57.5	8327	8532	8737	13.6	45	2	12	-16	+10.5	+12	T3
82	20	50	30	57.5	8329	8534	8739	24.9	45	2	16	-32	+13	+15	T3
82	10	50	30	57.5	8330	8535	8740	24.9	45	2	16	-32	+13	+15	T3
160	20	50	30	57.5	8332	8537	8742	25.7	27	8	32	-50	+25	+25	T4
160	10	50	30	57.5	8333	8538	8743	25.7	27	8	32	-50	+25	+25	T4

TO ORDER: **Indicate the prefix M39006/09 followed by the applicable MIL dash number**
Example: For M39006/09-8210 order M39006/098210

CLR65 (MIL-C-39006/09)
Wet Tantalum Capacitors

MALLORY

Cap (µF)	Cap Tol (±)	Maximum Working Voltage		Surge Voltage @	Part Number MIL-C-39006/09 Failure Rate Level (% / 1000 Hrs.)			Max DF	Max Z -55°C	Maximum DC Leakage (µA)		Maximum % Capacitance Change from Room Temperature			Case Code
		+85°C	+125°C	+85°C	M (1.0)	P (0.1)	R (0.01)	(%)	(Ohms)	+25°C	+85°C & +125°C	-55°C	+85°C	+125°C	
4	20	60	40	69	8334	8539	8744	3	550	1	2	-16	+5	+6	T1
4	10	60	40	69	8335	8540	8745	3	550	1	2	-16	+5	+6	T1
8.2	20	60	40	69	8337	8542	8747	5	275	1	2	-24	+8	+9	T1
8.2	10	60	40	69	8338	8543	8748	5	275	1	2	-24	+8	+9	T1
20	20	60	40	69	8340	8544	8750	7.6	105	1	5	-16	+10.5	+12	T2
20	10	60	40	69	8341	8546	8751	7.6	105	1	5	-16	+10.5	+12	T2
39	20	60	40	69	8343	8548	8753	20.7	90	1	9	-28	+10.5	+12	T2
39	10	60	40	69	8344	8549	8754	20.7	90	1	9	-28	+10.5	+12	T2
50	20	60	40	69	8346	8551	8756	15.3	50	2	12	-16	+10.5	+12	T3
50	10	60	40	69	8347	8552	8757	15.3	50	2	12	-16	+10.5	+12	T3
68	20	60	40	69	8349	8554	8759	30.7	50	2	16	-32	+10.5	+12	T3
68	10	60	40	69	8350	8555	8760	30.7	50	2	16	-32	+10.5	+12	T3
140	20	60	40	69	8352	8557	8762	25.7	28	8	32	-40	+20	+20	T4
140	10	60	40	69	8353	8558	8763	25.7	28	8	32	-40	+20	+20	T4
3.5	20	75	50	86.2	8354	8559	8764	2.5	650	1	2	-16	+5	+6	T1
3.5	10	75	50	86.2	8355	8560	8765	2.5	650	1	2	-16	+5	+6	T1
6.8	20	75	50	86.2	8357	8562	8767	4.1	300	1	2	-20	+8	+9	T1
6.8	10	75	50	86.2	8358	8563	8768	4.1	300	1	2	-20	+8	+9	T1
15	20	75	50	86.2	8360	8565	8770	7.5	150	1	5	-16	+8	+9	T2
15	10	75	50	86.2	8361	8566	8771	7.5	150	1	5	-16	+8	+9	T2
33	20	75	50	86.2	8363	8568	8773	17.5	90	1	10	-24	+10.5	+15	T2
33	10	75	50	86.2	8364	8569	8774	17.5	90	1	10	-24	+10.5	+15	T2
40	20	75	50	86.2	8366	8571	8776	15.2	60	2	12	-16	+10.5	+12	T3
40	10	75	50	86.2	8367	8572	8777	15.2	60	2	12	-16	+10.5	+12	T3
56	20	75	50	86.2	8369	8574	8779	26	60	2	17	-28	+10.5	+15	T3
56	10	75	50	86.2	8370	8575	8780	26	60	2	17	-28	+10.5	+15	T3
110	20	75	50	86.2	8372	8577	8782	25.7	29	9	36	-35	+20	+20	T4
110	10	75	50	86.2	8373	8578	8783	25.7	29	9	36	-35	+20	+20	T4
2.5	20	100	65	115	8374	8579	8784	5	950	1	2	-16	+7	+8	T1
2.5	10	100	65	115	8375	8580	8785	5	950	1	2	-16	+7	+8	T1
4.7	20	100	65	115	8377	8582	8787	3.6	500	1	2	-16	+7	+8	T1
4.7	10	100	65	115	8378	8583	8788	3.6	500	1	2	-16	+7	+8	T1
11	20	100	65	115	8380	8585	8790	5	200	1	4	-16	+7	+8	T2
11	10	100	65	115	8381	8586	8791	5	200	1	4	-16	+7	+8	T2
22	20	100	65	115	8383	8588	8793	11.8	100	1	9	-16	+7	+8	T2
22	10	100	65	115	8384	8589	8794	11.8	100	1	9	-16	+7	+8	T2
30	20	100	65	115	8386	8591	8796	9.1	80	2	12	-16	+7	+8	T3
30	10	100	65	115	8387	8592	8797	9.1	80	2	12	-16	+7	+8	T3
43	20	100	65	115	8389	8594	8799	19.7	70	2	17	-20	+7	+8	T3
43	10	100	65	115	8390	8595	8800	19.7	70	2	17	-20	+7	+8	T3
86	20	100	65	115	8392	8597	8802	20.7	30	9	36	-25	+15	+15	T4
86	10	100	65	115	8393	8598	8803	20.7	30	9	36	-25	+15	+15	T4
1.7	20	125	85	144	8394	8599	8804	7	1250	1	2	-16	+7	+8	T1
1.7	10	125	85	144	8395	8600	8805	7	1250	1	2	-16	+7	+8	T1
3.6	20	125	85	144	8397	8602	8807	4.1	600	1	2	-16	+7	+8	T1
3.6	10	125	85	144	8398	8603	8808	4.1	600	1	2	-16	+7	+8	T1
9	20	125	85	144	8400	8605	8810	10.2	240	1	5	-16	+7	+8	T2
9	10	125	85	144	8401	8606	8811	10.2	240	1	5	-16	+7	+8	T2
14	20	125	85	144	8403	8608	8813	12.7	167	1	7	-16	+7	+8	T2
14	10	125	85	144	8404	8609	8814	12.7	167	1	7	-16	+7	+8	T2
18	20	125	85	144	8406	8611	8816	15	129	2	9	-16	+7	+8	T3
18	10	125	85	144	8407	8612	8817	15	129	2	9	-16	+7	+8	T3
25	20	125	85	144	8409	8614	8819	19	93	2	13	-16	+7	+8	T3
25	10	125	85	144	8410	8615	8820	19	93	2	13	-16	+7	+8	T3
56	20	125	85	144	9030	9033	9036	17.5	32	10	40	-25	+15	+15	T4
56	10	125	85	144	9031	9034	9037	17.5	32	10	40	-25	+15	+15	T4

TO ORDER: **Indicate the prefix M39006/09 followed by the applicable MIL dash number**
Example: For M39006/09-8210 order M39006/098210

CLR69 (MIL-C-39006/21)
Wet Tantalum Capacitors

MALLORY

- Silver Case Technology
- Hermetically Sealed
- Rugged Construction
- High Shock and Vibration Capability
- High Capacitance per Case Size
- Low DCL and ESR
- Long Shelf Life
- Failure Rate Levels M, P and R

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
with voltage derating

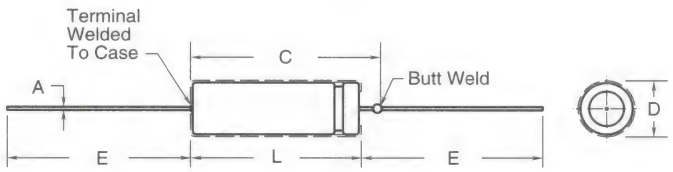
Voltage Range:
6 to 125 VDC

Capacitance Range:
6.8 μF to 2200 μF

Tolerance Range:
±10%, ±20%

Case Sizes: (Four)
.188 x.453 to .375 x 1.062

Maximum rms Ripple Current @ 85°C	
Case Code	mA
A	50
B	250
C	500
F	750



DIMENSIONS

Case Code	INCHES Uninsulated D ±.016	L +.031, -.016	Insulated D Max	L Max	C Max	A Lead Dia Nom	AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)	Case Code	MILLIMETERS Uninsulated D ±.41	L +.79, -.41	Insulated D Max	L Max	C Max	A Lead Dia Nom	AWG	E Lead Lgth ±6.35
T1	.188	.453	.219	.608	.734	.025	#22	1.500	1.2	T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
T2	.281	.641	.312	.796	.922	.025	#22	2.250	3.1	T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
T3	.375	.766	.406	.921	1.047	.025	#22	2.250	5.8	T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	9.0	T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

Cap (μF)	Cap Tol (±)	Maximum Working Voltage +85°C	+125°C	Surge Voltage @ +85°C	Part Number MIL-C-39006/21 Failure Rate Level (% / 1000 Hrs.) M (1.0)	P (0.1)	R (0.01)	Max DF (%)	Max Z -55°C (Ohms)	Maximum DC Leakage (μA) +25°C	+85°C & +125°C	Maximum % Capacitance Change from Room Temperature -55°C	+85°C	+125°C	Case Code
220	20	6	4	6.9	0089	0177	0265	50	36	2	9	-64	+13	+16	T1
220	10	6	4	6.9	0090	0178	0266	50	36	2	9	-64	+13	+16	T1
820	20	6	4	6.9	0091	0179	0267	155	18	3	14	-88	+16	+20	T2
820	10	6	4	6.9	0092	0180	0268	155	18	3	14	-88	+16	+20	T2
1500	20	6	4	6.9	0093	0181	0269	172	18	5	20	-90	+20	+25	T3
1500	10	6	4	6.9	0094	0182	0270	172	18	5	20	-90	+20	+25	T3
2200	20	6	4	6.9	0095	0183	0271	170	13	6	24	-90	+25	+30	T4
2200	10	6	4	6.9	0096	0184	0272	170	13	6	24	-90	+25	+30	T4
180	20	8	5	9.2	0097	0185	0273	41	45	2	9	-60	+13	+16	T1
180	10	8	5	9.2	0098	0186	0274	41	45	2	9	-60	+13	+16	T1
680	20	8	5	9.2	0099	0187	0275	130	22	3	14	-83	+16	+20	T2
680	10	8	5	9.2	0100	0188	0276	130	22	3	14	-83	+16	+20	T2
1500	20	8	5	9.2	0101	0189	0277	170	18	5	20	-90	+20	+25	T3
1500	10	8	5	9.2	0102	0190	0278	170	18	5	20	-90	+20	+25	T3
1800	20	8	5	9.2	0103	0191	0279	138	14	7	25	-90	+25	+30	T4
1800	10	8	5	9.2	0104	0192	0280	138	14	7	25	-90	+25	+30	T4
150	20	10	7	11.5	0105	0193	0281	34	54	2	9	-55	+13	+16	T1
150	10	10	7	11.5	0106	0194	0282	34	54	2	9	-55	+13	+16	T1
560	20	10	7	11.5	0107	0195	0283	106	27	3	16	-77	+16	+20	T2
560	10	10	7	11.5	0108	0196	0284	106	27	3	16	-77	+16	+20	T2
1200	20	10	7	11.5	0109	0197	0285	137	18	5	20	-88	+20	+25	T3
1200	10	10	7	11.5	0110	0198	0286	137	18	5	20	-88	+20	+25	T3
1500	20	10	7	11.5	0111	0199	0287	114	15	7	25	-88	+25	+30	T4
1500	10	10	7	11.5	0112	0200	0288	114	15	7	25	-88	+25	+30	T4

TO ORDER: **Indicate the prefix M39006/21 followed by the applicable MIL dash number**
Example: For M39006/21-0197 order M39006/210197

CLR69 (MIL-C-39006/21)
Wet Tantalum Capacitors

MALLORY

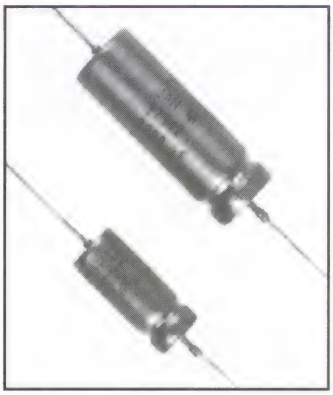
Cap (µF)	Cap Tol (±)	Maximum Working Voltage		Surge Voltage @	Part Number MIL-C-39006/21 Failure Rate Level (% / 1000 Hrs.)			Max DF	Max Z -55°C	Maximum DC Leakage (µA)		Maximum % Capacitance Change from Room Temperature			Case Code
		+85°C	+125°C	+85°C	M (1.0)	P (0.1)	R (0.01)	(%)	(Ohms)	+25°C	+85°C & +125°C	-55°C	+85°C	+125°C	
100	20	15	10	17.2	0113	0201	0289	30	72	2	9	-44	+13	+16	T1
100	10	15	10	17.2	0114	0202	0290	30	72	2	9	-44	+13	+16	T1
390	20	15	10	17.2	0115	0203	0291	74	31	3	16	-66	+16	+20	T2
390	10	15	10	17.2	0116	0204	0292	74	31	3	16	-66	+16	+20	T2
820	20	15	10	17.2	0117	0205	0293	111	22	6	24	-77	+20	+25	T3
820	10	15	10	17.2	0118	0206	0294	111	22	6	24	-77	+20	+25	T3
1000	20	15	10	17.2	0119	0207	0295	92	17	8	32	-77	+25	+30	T4
1000	10	15	10	17.2	0120	0208	0296	92	17	8	32	-77	+25	+30	T4
68	20	25	15	28.8	0121	0209	0297	22	90	2	9	-40	+12	+15	T1
68	10	25	15	28.8	0122	0210	0298	22	90	2	9	-40	+12	+15	T1
270	20	25	15	28.8	0123	0211	0299	55	33	3	16	-62	+13	+16	T2
270	10	25	15	28.8	0124	0212	0300	55	33	3	16	-62	+13	+16	T2
560	20	25	15	28.8	0125	0213	0301	76	24	7	28	-72	+20	+25	T3
560	10	25	15	28.8	0126	0214	0302	76	24	7	28	-72	+20	+25	T3
680	20	25	15	28.8	0127	0215	0303	63	19	8	32	-72	+25	+30	T4
680	10	25	15	28.8	0128	0216	0304	63	19	8	32	-72	+25	+30	T4
56	20	30	20	34.5	0129	0217	0305	22	100	2	9	-38	+12	+15	T1
56	10	30	20	34.5	0130	0218	0306	22	100	2	9	-38	+12	+15	T1
220	20	30	20	34.5	0131	0219	0307	42	36	3	16	-60	+13	+16	T2
220	10	30	20	34.5	0132	0220	0308	42	36	3	16	-60	+13	+16	T2
470	20	30	20	34.5	0133	0221	0309	64	25	8	32	-65	+20	+25	T3
470	10	30	20	34.5	0134	0222	0310	64	25	8	32	-65	+20	+25	T3
560	20	30	20	34.5	0135	0223	0311	55	20	9	36	-65	+25	+30	T4
560	10	30	20	34.5	0136	0224	0312	55	20	9	36	-65	+25	+30	T4
33	20	50	30	57.5	0137	0225	0313	12.3	135	2	9	-29	+10	+12	T1
33	10	50	30	57.5	0138	0226	0314	12.3	135	2	9	-29	+10	+12	T1
120	20	50	30	57.5	0139	0227	0315	22.5	49	4	24	-42	+12	+15	T2
120	10	50	30	57.5	0140	0228	0316	22.5	49	4	24	-42	+12	+15	T2
270	20	50	30	57.5	0141	0229	0317	37	29	8	32	-46	+20	+25	T3
270	10	50	30	57.5	0142	0230	0318	37	29	8	32	-46	+20	+25	T3
330	20	50	30	57.5	0143	0231	0319	38	22	9	36	-46	+25	+30	T4
330	10	50	30	57.5	0144	0232	0320	38	22	9	36	-46	+25	+30	T4
27	20	60	40	69	0145	0233	0321	10.2	144	3	12	-24	+10	+12	T1
27	10	60	40	69	0146	0234	0322	10.2	144	3	12	-24	+10	+12	T1
100	20	60	40	69	0147	0235	0323	19	54	4	20	-36	+12	+15	T2
100	10	60	40	69	0148	0236	0324	19	54	4	20	-36	+12	+15	T2
220	20	60	40	69	0149	0237	0325	30	29	8	32	-40	+16	+20	T3
220	10	60	40	69	0150	0238	0326	30	29	8	32	-40	+16	+20	T3
270	20	60	40	69	0151	0239	0327	27	23	9	36	-45	+20	+25	T4
270	10	60	40	69	0152	0240	0328	27	23	9	36	-45	+20	+25	T4
22	20	75	50	86.2	0153	0241	0329	8.5	157	3	12	-19	+10	+12	T1
22	10	75	50	86.2	0154	0242	0330	8.5	157	3	12	-19	+10	+12	T1
82	20	75	50	86.2	0155	0243	0331	15.2	63	4	24	-30	+12	+15	T2
82	10	75	50	86.2	0156	0244	0332	15.2	63	4	24	-30	+12	+15	T2
180	20	75	50	86.2	0157	0245	0333	24.4	30	9	36	-35	+16	+20	T3
180	10	75	50	86.2	0158	0246	0334	24.4	30	9	36	-35	+16	+20	T3
220	20	75	50	86.2	0159	0247	0335	37	24	10	40	-40	+20	+25	T4
220	10	75	50	86.2	0160	0248	0336	37	24	10	40	-40	+20	+25	T4
10	20	100	65	115	0161	0249	0337	4.5	200	3	12	-17	+10	+12	T1
10	10	100	65	115	0162	0250	0338	4.5	200	3	12	-17	+10	+12	T1
39	20	100	65	115	0163	0251	0339	10.4	80	5	24	-20	+12	+15	T2
39	10	100	65	115	0164	0252	0340	10.4	80	5	24	-20	+12	+15	T2
68	20	100	65	115	0165	0253	0341	11.3	40	10	40	-30	+14	+16	T3
68	10	100	65	115	0166	0254	0342	11.3	40	10	40	-30	+14	+16	T3
120	20	100	65	115	0167	0255	0343	25	30	12	48	-35	+15	+17	T4
120	10	100	65	115	0168	0256	0344	25	30	12	48	-35	+15	+17	T4
6.8	20	125	85	144	0169	0257	0345	6	300	3	12	-14	+10	+12	T1
6.8	10	125	85	144	0170	0258	0346	6	300	3	12	-14	+10	+12	T1
27	20	125	85	144	0171	0259	0347	7.2	90	5	24	-18	+12	+15	T2
27	10	125	85	144	0172	0260	0348	7.2	90	5	24	-18	+12	+15	T2
47	20	125	85	144	0173	0261	0349	7.9	50	10	40	-26	+14	+16	T3
47	10	125	85	144	0174	0262	0350	7.9	50	10	40	-26	+14	+16	T3
82	20	125	85	144	0175	0263	0351	17.4	32	12	48	-30	+15	+17	T4
82	10	125	85	144	0176	0264	0352	17.4	32	12	48	-30	+15	+17	T4

TO ORDER: **Indicate the prefix M39006/21 followed by the applicable MIL dash number**
Example: For M39006/21-0197 order M39006/210197

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

CLR79 (MIL-C-39006/22)
Wet Tantalum Capacitors

MALLORY



- All Tantalum Case
- Hermetically Sealed
- Up to 3 Volts Reverse Capability
- Higher Ripple Current Capability
- Low DCL and ESR
- Rugged Construction
- Failure Rate Levels M, P and R

GENERAL SPECIFICATIONS

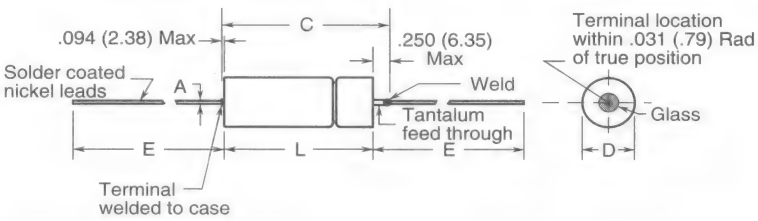
Operating Temperature:
-55°C to +125°C
with voltage derated

Voltage Range:
6 to 125 VDC

Capacitance Range:
1.7 μF to 1200 μF

Tolerance Range:
±10%, ±20%
(±5% by special order)

Case Sizes: (Four)
.188 x.453 to .375 x 1.062



DIMENSIONS

Case Code	INCHES Uninsulated D ±.016	Uninsulated L +.031, -.016	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)	Case Code	MILLIMETERS Uninsulated D ±.41	Uninsulated L +.79, -.41	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±6.35
T1	.188	.453	.219	.608	.734	.025	#22	1.500	2.0	T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
T2	.281	.641	.312	.796	.922	.025	#22	2.250	4.5	T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
T3	.375	.766	.406	.921	1.047	.025	#22	2.250	8.0	T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	12.0	T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

Cap (μF)	Cap Tol (±)	Maximum Working Voltage +85°C	Maximum Working Voltage +125°C	Surge Voltage +85°C	Part Number MIL-C-39006/22 Failure Rate Level % / 1,000 Hrs M (1.0)	P (0.1)	R (0.01)	Max DF (%)	Max ESR Ω +25°C	Maximum DC Leakage (μA) +25°C	Maximum DC Leakage (μA) +85°C & +125°C	Max Ripple @ 85°C 40kHz (mA)	Maximum % Capacitance Change from Room Temperature -55°C	+85°C	+125°C	Case Code
30	20	6	4	6.92	0001	0221	0441	9	3.98	1	2	820	-40	+10.5	+12	T1
30	10	6	4	6.9	0002	0222	0442	9	3.98	1	2	820	-40	+10.5	+12	T1
68	20	6	4	6.9	0004	0224	0444	15	3.16	1	2	960	-40	+14	+16	T1
68	10	6	4	6.9	0005	0225	0445	15	3.16	1	2	960	-40	+14	+16	T1
140	20	6	4	6.9	0007	0227	0447	21	1.99	1	3	1200	-40	+14	+16	T2
140	10	6	4	6.9	0008	0228	0448	21	1.99	1	3	1200	-40	+14	+16	T2
270	20	6	4	6.9	0010	0230	0450	45	2.21	1	6.5	1375	-44	+17.5	+20	T2
270	10	6	4	6.9	0011	0231	0451	45	2.21	1	6.5	1375	-44	+17.5	+20	T2
330	20	6	4	6.9	0013	0233	0453	36	1.45	2	7.9	1800	-44	+14	+16	T3
330	10	6	4	6.9	0014	0234	0454	36	1.45	2	7.9	1800	-44	+14	+16	T3
560	20	6	4	6.9	0016	0236	0456	55	1.30	2	13	1900	-64	+17.5	+20	T3
560	10	6	4	6.9	0017	0237	0457	55	1.30	2	13	1900	-64	+17.5	+20	T3
1200	20	6	4	6.9	0019	0239	0459	90	1.00	3	14	2265	-80	+25	+25	T4
1200	10	6	4	6.9	0020	0240	0460	90	1.00	3	14	2265	-80	+25	+25	T4
25	20	8	5	9.2	0021	0241	0461	7.5	3.98	1	2	820	-40	+10.5	+12	T1
25	10	8	5	9.2	0022	0242	0462	7.5	3.98	1	2	820	-40	+10.5	+12	T1
56	20	8	5	9.2	0024	0244	0464	14	3.32	1	2	900	-40	+14	+16	T1
56	10	8	5	9.2	0025	0245	0465	14	3.32	1	2	900	-40	+14	+16	T1
120	20	8	5	9.2	0027	0247	0467	20	2.21	1	2	1220	-44	+17.5	+20	T2
120	10	8	5	9.2	0028	0248	0468	20	2.21	1	2	1220	-44	+17.5	+20	T2
220	20	8	5	9.2	0030	0250	0470	37	2.23	1	7	1370	-44	+17.5	+20	T2
220	10	8	5	9.2	0031	0251	0471	37	2.23	1	7	1370	-44	+17.5	+20	T2
290	20	8	5	9.2	0033	0253	0473	34	1.56	2	6	1770	-64	+17.5	+20	T3
290	10	8	5	9.2	0034	0254	0474	34	1.56	2	6	1770	-64	+17.5	+20	T3
430	20	8	5	9.2	0036	0256	0476	46	1.42	2	14	1825	-64	+17.5	+20	T3
430	10	8	5	9.2	0037	0257	0477	46	1.42	2	14	1825	-64	+17.5	+20	T3
850	20	8	5	9.2	0039	0259	0479	60	0.94	4	16	2330	-80	+25	+25	T4
850	10	8	5	9.2	0040	0260	0480	60	0.94	4	16	2330	-80	+25	+25	T4

TO ORDER: **Indicate the prefix M39006/22 followed by the applicable MIL dash number Example: For M39006/22-0251 order M39006/220251. To obtain the optional vibration and shock requirements, add 'H' (M39006/220251H)**

CLR79 (MIL-C-39006/22)
Wet Tantalum Capacitors

MALLORY

Cap (µF)	Cap Tol (±)	Maximum Working Voltage		Surge Voltage @	Part Number MIL-C-39006/22 Failure Rate Level % / 1,000 Hrs			Max DF	Max ESR Ω @	Maximum DC Leakage (µA)		Max Ripple @ 85°C 40kHz	Maximum % Capacitance Change from Room Temperature			Case Code
		+85°C	+125°C	+85°C	M (1.0)	P (0.1)	R (0.01)	(%)	+25°C	+25°C	+85°C & +125°C	(mA)	-55°C	+85°C	+125°C	
20	20	10	7	11.5	0041	0261	0481	6	3.98	1	2	820	-32	+10.5	+12	T1
20	10	10	7	11.5	0042	0262	0482	6	3.98	1	2	820	-32	+10.5	+12	T1
47	20	10	7	11.5	0044	0264	0484	13	3.67	1	2	855	-36	+14	+16	T1
47	10	10	7	11.5	0045	0265	0485	13	3.67	1	2	855	-36	+14	+16	T1
100	20	10	7	11.5	0047	0267	0487	15	1.99	1	4	1200	-36	+14	+16	T2
100	10	10	7	11.5	0048	0268	0488	15	1.99	1	4	1200	-36	+14	+16	T2
180	20	10	7	11.5	0050	0270	0490	30	2.21	1	7	1365	-36	+14	+16	T2
180	10	10	7	11.5	0051	0271	0491	30	2.21	1	7	1365	-36	+14	+16	T2
250	20	10	7	11.5	0053	0273	0493	30	1.59	2	10	1720	-40	+14	+16	T3
250	10	10	7	11.5	0054	0274	0494	30	1.59	2	10	1720	-40	+14	+16	T3
390	20	10	7	11.5	0056	0276	0496	44	1.50	2	16	1800	-64	+17.5	+20	T3
390	10	10	7	11.5	0057	0277	0497	44	1.50	2	16	1800	-64	+17.5	+20	T3
750	20	10	7	11.5	0059	0279	0499	50	0.88	4	16	2360	-80	+25	+25	T4
750	10	10	7	11.5	0060	0280	0500	50	0.88	4	16	2360	-80	+25	+25	T4
15	20	15	10	17.2	0061	0281	0501	5	4.42	1	2	780	-24	+10.5	+12	T1
15	10	15	10	17.2	0062	0282	0502	5	4.42	1	2	780	-24	+10.5	+12	T1
33	20	15	10	17.2	0064	0284	0504	10	4.02	1	2	820	-28	+14	+16	T1
33	10	15	10	17.2	0065	0285	0505	10	4.02	1	2	820	-28	+14	+16	T1
70	20	15	10	17.2	0067	0287	0507	13	2.46	1	4	1150	-28	+14	+16	T2
70	10	15	10	17.2	0068	0288	0508	13	2.46	1	4	1150	-28	+14	+16	T2
120	20	15	10	17.2	0070	0290	0510	18	1.99	1	7	1450	-28	+17.5	+20	T2
120	10	15	10	17.2	0071	0291	0511	18	1.99	1	7	1450	-28	+17.5	+20	T2
170	20	15	10	17.2	0073	0293	0513	25	1.95	2	10	1480	-32	+14	+16	T3
170	10	15	10	17.2	0074	0294	0514	25	1.95	2	10	1480	-32	+14	+16	T3
270	20	15	10	17.2	0076	0296	0516	32	1.57	2	16	1740	-56	+17.5	+20	T3
270	10	15	10	17.2	0077	0297	0517	32	1.57	2	16	1740	-56	+17.5	+20	T3
540	20	15	10	17.2	0079	0299	0519	40	0.98	6	24	2330	-80	+25	+25	T4
540	10	15	10	17.2	0080	0300	0520	40	0.98	6	24	2330	-80	+25	+25	T4
10	20	25	15	28.8	0081	0301	0521	4	5.31	1	2	715	-16	+8	+9	T1
10	10	25	15	28.8	0082	0302	0522	4	5.31	1	2	715	-16	+8	+9	T1
22	20	25	15	28.8	0084	0304	0524	6.6	3.98	1	2	825	-20	+10.5	+12	T1
22	10	25	15	28.8	0085	0305	0525	6.6	3.98	1	2	825	-20	+10.5	+12	T1
50	20	25	15	28.8	0087	0307	0527	11	2.92	1	2	1130	-28	+13	+15	T2
50	10	25	15	28.8	0088	0308	0528	11	2.92	1	2	1130	-28	+13	+15	T2
100	20	25	15	28.8	0090	0310	0530	15	1.99	1	10	1435	-28	+13	+15	T2
100	10	25	15	28.8	0091	0311	0531	15	1.99	1	10	1435	-28	+13	+15	T2
120	20	25	15	28.8	0093	0313	0533	21	2.32	2	6	1450	-32	+13	+15	T3
120	10	25	15	28.8	0094	0314	0534	21	2.32	2	6	1450	-32	+13	+15	T3
180	20	25	15	28.8	0096	0316	0536	26	1.92	2	18	1525	-48	+13	+15	T3
180	10	25	15	28.8	0097	0317	0537	26	1.92	2	18	1525	-48	+13	+15	T3
350	20	25	15	28.8	0099	0319	0539	35	1.33	7	28	1970	-70	+25	+25	T4
350	10	25	15	28.8	0100	0320	0540	35	1.33	7	28	1970	-70	+25	+25	T4
8	20	30	20	34.5	0101	0321	0541	4	6.64	1	2	640	-16	+8	+12	T1
8	10	30	20	34.5	0102	0322	0542	4	6.64	1	2	640	-16	+8	+12	T1
15	20	30	20	34.5	0104	0324	0544	5	4.42	1	2	780	-20	+10.5	+12	T1
15	10	30	20	34.5	0105	0325	0545	5	4.42	1	2	780	-20	+10.5	+12	T1
40	20	30	20	34.5	0107	0327	0547	10	3.32	1	5	1120	-24	+10.5	+12	T2
40	10	30	20	34.5	0108	0328	0548	10	3.32	1	5	1120	-24	+10.5	+12	T2
68	20	30	20	34.5	0110	0330	0550	13	2.54	1	8	1285	-24	+13	+15	T2
68	10	30	20	34.5	0111	0331	0551	13	2.54	1	8	1285	-24	+13	+15	T2
100	20	30	20	34.5	0113	0333	0553	17	2.26	2	12	1450	-28	+10.5	+12	T3
100	10	30	20	34.5	0114	0334	0554	17	2.26	2	12	1450	-28	+10.5	+12	T3
150	20	30	20	34.5	0116	0336	0556	23	2.03	2	18	1525	-48	+13	+15	T3
150	10	30	20	34.5	0117	0337	0557	23	2.03	2	18	1525	-48	+13	+15	T3
300	20	30	20	34.5	0119	0339	0559	31	1.37	8	32	1950	-60	+25	+25	T4
300	10	30	20	34.5	0120	0340	0560	31	1.37	8	32	1950	-60	+25	+25	T4
5	20	50	30	57.5	0121	0341	0561	3	7.96	1	2	580	-16	+5	+6	T1
5	10	50	30	57.5	0122	0342	0562	3	7.96	1	2	580	-16	+5	+6	T1
10	20	50	30	57.5	0124	0344	0564	4	5.31	1	2	715	-24	+8	+9	T1
10	10	50	30	57.5	0125	0345	0565	4	5.31	1	2	715	-24	+8	+9	T1
25	20	50	30	57.5	0127	0347	0567	8	4.25	1	5	1005	-20	+10.5	+12	T2
25	10	50	30	57.5	0128	0348	0568	8	4.25	1	5	1005	-20	+10.5	+12	T2
47	20	50	30	57.5	0130	0350	0570	11	3.11	1	9	1155	-28	+13	+15	T2
47	10	50	30	57.5	0131	0351	0571	11	3.11	1	9	1155	-28	+13	+15	T2

TO ORDER: **Indicate the prefix M39006/22 followed by the applicable MIL dash number Example: For M39006/22-0251 order M39006/220251. To obtain the optional vibration and shock requirements, add 'H' (M39006/220251H)**

CLR79 (MIL-C-39006/22)
Wet Tantalum Capacitors

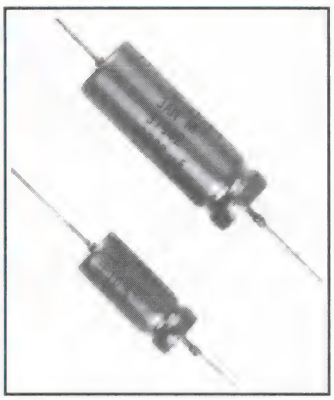
MALLORY

Cap (µF)	Cap Tol (±)	Maximum Working Voltage		Surge Voltage @ +85°C	Part Number MIL-C-39006/22 Failure Rate Level % / 1,000 Hrs			Max DF (%)	Max ESR Ω @ +25°C	Maximum DC Leakage (µA)		Max Ripple @ 85°C 40kHz (mA)	Maximum % Capacitance Change from Room Temperature			Case Code
		+85°C	+125°C		M (1.0)	P (0.1)	R (0.01)			+25°C	+85°C & +125°C		-55°C	+85°C	+125°C	
60	20	50	30	57.5	0133	0353	0573	12	2.65	2	12	1335	-16	+10.5	+12	T3
60	10	50	30	57.5	0134	0354	0574	12	2.65	2	12	1335	-16	+10.5	+12	T3
82	20	50	30	57.5	0136	0356	0576	15	2.43	2	16	1400	-32	+13	+15	T3
82	10	50	30	57.5	0137	0357	0577	15	2.43	2	16	1400	-32	+13	+15	T3
160	20	50	30	57.5	0139	0359	0579	17	1.41	8	32	1900	-50	+25	+25	T4
160	10	50	30	57.5	0140	0360	0580	17	1.41	8	32	1900	-50	+25	+25	T4
4	20	60	40	69	0141	0361	0581	2.8	9.29	1	2	525	-16	+5	+6	T1
4	10	60	40	69	0142	0362	0582	2.8	9.29	1	2	525	-16	+5	+6	T1
8.2	20	60	40	69	0144	0364	0584	4	6.47	1	2	625	-24	+8	+9	T1
8.2	10	60	40	69	0145	0365	0585	4	6.47	1	2	625	-24	+8	+9	T1
20	20	60	40	69	0147	0367	0587	7	4.64	1	5	930	-16	+10.5	+12	T2
20	10	60	40	69	0148	0368	0588	7	4.64	1	5	930	-16	+10.5	+12	T2
39	20	60	40	69	0150	0370	0590	10	3.40	1	9	1110	-28	+10.5	+12	T2
39	10	60	40	69	0151	0371	0591	10	3.40	1	9	1110	-28	+10.5	+12	T2
50	20	60	40	69	0153	0373	0593	10	2.65	2	12	1330	-16	+10.5	+12	T3
50	10	60	40	69	0154	0374	0594	10	2.65	2	12	1330	-16	+10.5	+12	T3
68	20	60	40	69	0156	0376	0596	13	2.54	2	16	1365	-32	+10.5	+12	T3
68	10	60	40	69	0157	0377	0597	13	2.54	2	16	1365	-32	+10.5	+12	T3
140	20	60	40	69	0159	0379	0599	16	1.52	8	32	1850	-40	+20	+20	T4
140	10	60	40	69	0160	0380	0600	16	1.52	8	32	1850	-40	+20	+20	T4
3.5	20	75	50	86.2	0161	0381	0601	2.5	9.48	1	2	525	-16	+5	+6	T1
3.5	10	75	50	86.2	0162	0382	0602	2.5	9.48	1	2	525	-16	+5	+6	T1
6.8	20	75	50	86.2	0164	0384	0604	3.5	6.83	1	2	610	-20	+8	+9	T1
6.8	10	75	50	86.2	0165	0385	0605	3.5	6.83	1	2	610	-20	+8	+9	T1
15	20	75	50	86.2	0167	0387	0607	6	5.31	1	5	890	-16	+8	+9	T2
15	10	75	50	86.2	0168	0388	0608	6	5.31	1	5	890	-16	+8	+9	T2
33	20	75	50	86.2	0170	0390	0610	10	4.02	1	10	1000	-24	+10.5	+15	T2
33	10	75	50	86.2	0171	0391	0611	10	4.02	1	10	1000	-24	+10.5	+15	T2
40	20	75	50	86.2	0173	0393	0613	9	2.99	2	12	1250	-16	+10.5	+12	T3
40	10	75	50	86.2	0174	0394	0614	9	2.99	2	12	1250	-16	+10.5	+12	T3
56	20	75	50	86.2	0176	0396	0616	11	2.61	2	17	1335	-28	+10.5	+15	T3
56	10	75	50	86.2	0177	0397	0617	11	2.61	2	17	1335	-28	+10.5	+15	T3
110	20	75	50	86.2	0179	0399	0619	12	1.45	9	36	1850	-35	+20	+20	T4
110	10	75	50	86.2	0180	0400	0620	12	1.45	9	36	1850	-35	+20	+20	T4
2.5	20	100	65	115	0181	0401	0621	2	10.62	1	2	505	-16	+7	+8	T1
2.5	10	100	65	115	0182	0402	0622	2	10.62	1	2	505	-16	+7	+8	T1
4.7	20	100	65	115	0184	0404	0624	3	8.47	1	2	565	-16	+7	+8	T1
4.7	10	100	65	115	0185	0405	0625	3	8.47	1	2	565	-16	+7	+8	T1
11	20	100	65	115	0187	0407	0627	5	6.03	1	4	835	-16	+8	+8	T2
11	10	100	65	115	0188	0408	0628	5	6.03	1	4	835	-16	+8	+8	T2
22	20	100	65	115	0190	0410	0630	7.5	4.52	1	9	965	-16	+8	+8	T2
22	10	100	65	115	0191	0411	0631	7.5	4.52	1	9	965	-16	+8	+8	T2
30	20	100	65	115	0193	0413	0633	7	3.10	2	12	1240	-16	+8	+8	T3
30	10	100	65	115	0194	0414	0634	7	3.10	2	12	1240	-16	+8	+8	T3
43	20	100	65	115	0196	0416	0636	8.5	2.62	2	17	1335	-20	+8	+8	T3
43	10	100	65	115	0197	0417	0637	8.5	2.62	2	17	1335	-20	+8	+8	T3
86	20	100	65	115	0199	0419	0639	10	1.54	9	36	1800	-25	+15	+15	T4
86	10	100	65	115	0200	0420	0640	10	1.54	9	36	1800	-25	+15	+15	T4
1.7	20	125	85	144	0201	0421	0641	2	15.61	1	2	415	-16	+7	+8	T1
1.7	10	125	85	144	0202	0422	0642	2	15.61	1	2	415	-16	+7	+8	T1
3.6	20	125	85	144	0204	0424	0644	2.7	9.95	1	2	520	-16	+7	+8	T1
3.6	10	125	85	144	0205	0425	0645	2.7	9.95	1	2	520	-16	+7	+8	T1
9	20	125	85	144	0207	0427	0647	5	7.37	1	5	755	-16	+7	+8	T2
9	10	125	85	144	0208	0428	0648	5	7.37	1	5	755	-16	+7	+8	T2
14	20	125	85	144	0210	0430	0650	6	5.69	1	7	860	-16	+7	+8	T2
14	10	125	85	144	0211	0431	0651	6	5.69	1	7	860	-16	+7	+8	T2
18	20	125	85	144	0213	0433	0653	5	3.69	2	9	1130	-16	+7	+8	T3
18	10	125	85	144	0214	0434	0654	5	3.69	2	9	1130	-16	+7	+8	T3
25	20	125	85	144	0216	0436	0656	6	3.18	2	13	1200	-16	+7	+8	T3
25	10	125	85	144	0217	0437	0657	6	3.18	2	13	1200	-16	+7	+8	T3
56	20	125	85	144	0219	0439	0659	6.5	1.54	10	40	1800	-25	+15	+15	T4
56	10	125	85	144	0220	0440	0660	6.5	1.54	10	40	1800	-25	+15	+15	T4

TO ORDER: **Indicate the prefix M39006/22 followed by the applicable MIL dash number Example: For M39006/22-0251 order M39006/220251. To obtain the optional vibration and shock requirements, add 'H' (M39006/220251H)**

CLR81 (MIL-C-39006/25)
Wet Tantalum Capacitors

MALLORY



- Extended Range
- All Tantalum Case
- Hermetically Sealed
- Up to 3 Volts Reverse Capability
- Highest CV per Case Size
- Low DCL and ESR
- Rugged Construction
- Failure Rate Levels M, P and R

GENERAL SPECIFICATIONS

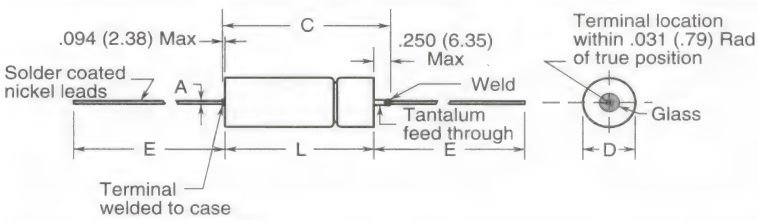
Operating Temperature:
-55°C to +125°C
with voltage derated

Voltage Range:
6 to 125 VDC

Capacitance Range:
6.8 μF to 2200 μF

Tolerance Range:
±10%, ±20%

Case Sizes: (Four)
.188 x.453 to .375 x 1.062



DIMENSIONS

Case Code	INCHES Uninsulated D ±.016	Uninsulated L +.031, -.016	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)	Case Code	MILLIMETERS Uninsulated D ±.41	Uninsulated L +.79, -.41	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±6.35
T1	.188	.453	.219	.608	.734	.025	#22	1.500	2.0	T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
T2	.281	.641	.312	.796	.922	.025	#22	2.250	5.5	T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
T3	.375	.766	.406	.921	1.047	.025	#22	2.250	10.0	T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	16.0	T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

Cap (μF)	Cap Tol (±)	Maximum Working Voltage +85°C	Maximum Working Voltage +125°C	Surge Voltage @ +85°C	Part Number MIL-C-39006/25 Failure Rate Level % / 1,000 Hrs M (1.0)	P (0.1)	R (0.01)	Max DF (%)	Max ESR Ω @ +25°C	Maximum DC Leakage (μA) +25°C	+85°C & +125°C	Max Ripple @ 85°C 40kHz (mA)	Maximum % Capacitance Change from Room Temperature -55°C	+85°C	+125°C	Case Code
220	20	6	4	6.9	0001	0089	0177	50	3.02	2	9	1000	-64	+13	+16	T1
220	10	6	4	6.9	0002	0090	0178	50	3.02	2	9	1000	-64	+13	+16	T1
820	20	6	4	6.9	0003	0091	0179	155	2.51	3	14	1500	-88	+16	+20	T2
820	10	6	4	6.9	0004	0092	0180	155	2.51	3	14	1500	-88	+16	+20	T2
1500	20	6	4	6.9	0005	0093	0181	172	1.52	5	20	1900	-90	+20	+25	T3
1500	10	6	4	6.9	0006	0094	0182	172	1.52	5	20	1900	-90	+20	+25	T3
2200	20	6	4	6.9	0007	0095	0183	170	1.03	6	24	2300	-90	+25	+30	T4
2200	10	6	4	6.9	0008	0096	0184	170	1.03	6	24	2300	-90	+25	+30	T4
180	20	8	5	9.2	0009	0097	0185	41	3.02	2	9	1000	-60	+13	+16	T1
180	10	8	5	9.2	0010	0098	0186	41	3.02	2	9	1000	-60	+13	+16	T1
680	20	8	5	9.2	0011	0099	0187	130	2.54	3	14	1500	-83	+16	+20	T2
680	10	8	5	9.2	0012	0100	0188	130	2.54	3	14	1500	-83	+16	+20	T2
1500	20	8	5	9.2	0013	0101	0189	170	1.50	5	20	1900	-90	+20	+25	T3
1500	10	8	5	9.2	0014	0102	0190	170	1.50	5	20	1900	-90	+20	+25	T3
1800	20	8	5	9.2	0015	0103	0191	138	1.02	7	25	2300	-90	+25	+30	T4
1800	10	8	5	9.2	0016	0104	0192	138	1.02	7	25	2300	-90	+25	+30	T4
150	20	10	7	11.5	0017	0105	0193	34	3.01	2	9	900	-55	+13	+16	T1
150	10	10	7	11.5	0018	0106	0194	34	3.01	2	9	900	-55	+13	+16	T1
560	20	10	7	11.5	0019	0107	0195	106	2.51	3	16	1450	-77	+16	+20	T2
560	10	10	7	11.5	0020	0108	0196	106	2.51	3	16	1450	-77	+16	+20	T2
1200	20	10	7	11.5	0021	0109	0197	137	1.51	5	20	1850	-88	+20	+25	T3
1200	10	10	7	11.5	0022	0110	0198	137	1.51	5	20	1850	-88	+20	+25	T3
1500	20	10	7	11.5	0023	0111	0199	114	1.01	7	25	2300	-88	+25	+30	T4
1500	10	10	7	11.5	0024	0112	0200	114	1.01	7	25	2300	-88	+25	+30	T4
100	20	15	10	17.2	0025	0113	0201	30	3.98	2	9	900	-44	+13	+16	T1
100	10	15	10	17.2	0026	0114	0202	30	3.98	2	9	900	-44	+13	+16	T1
390	20	15	10	17.2	0027	0115	0203	74	2.52	3	16	1450	-66	+16	+20	T2
390	10	15	10	17.2	0028	0116	0204	74	2.52	3	16	1450	-66	+16	+20	T2

TO ORDER: **Indicate the prefix M39006/25 followed by the applicable MIL dash number Example: For M39006/25-0193 order M39006/250193. To obtain the optional vibration and shock requirements, add 'H' (M39006/250193H)**

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

CLR81 (MIL-C-39006/25)
Wet Tantalum Capacitors

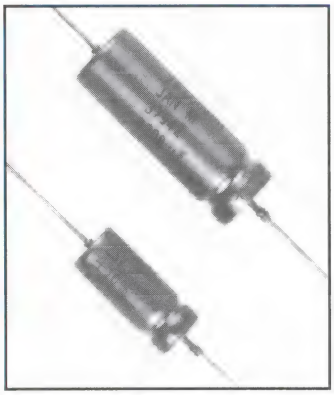
MALLORY

Cap (µF)	Cap Tol (±)	Maximum Working Voltage		Surge Voltage @	Part Number MIL-C-39006/25 Failure Rate Level % / 1,000 Hrs			Max DF	Max ESR Ω @	Maximum DC Leakage (µA)		Max Ripple @ 85°C 40kHz	Maximum % Capacitance Change from Room Temperature			Case Code
		+85°C	+125°C	+85°C	M (1.0)	P (0.1)	R (0.01)	(%)	+25°C	+25°C	+85°C & +125°C	(mA)	-55°C	+85°C	+125°C	
820	20	15	10	17.2	0029	0117	0205	111	1.80	6	24	1800	-77	+20	+25	T3
820	10	15	10	17.2	0030	0118	0206	111	1.80	6	24	1800	-77	+20	+25	T3
1000	20	15	10	17.2	0031	0119	0207	92	1.22	8	32	2300	-77	+25	+30	T4
1000	10	15	10	17.2	0032	0120	0208	92	1.22	8	32	2300	-77	+25	+30	T4
68	20	25	15	28.8	0033	0121	0209	22	4.29	2	9	850	-40	+12	+15	T1
68	10	25	15	28.8	0034	0122	0210	22	4.29	2	9	850	-40	+12	+15	T1
270	20	25	15	28.8	0035	0123	0211	55	2.70	3	16	1400	-62	+13	+16	T2
270	10	25	15	28.8	0036	0124	0212	55	2.70	3	16	1400	-62	+13	+16	T2
560	20	25	15	28.8	0037	0125	0213	76	1.80	7	28	1750	-72	+20	+25	T3
560	10	25	15	28.8	0038	0126	0214	76	1.80	7	28	1750	-72	+20	+25	T3
680	20	25	15	28.8	0039	0127	0215	63	1.23	8	32	2100	-72	+25	+30	T4
680	10	25	15	28.8	0040	0128	0216	63	1.23	8	32	2100	-72	+25	+30	T4
56	20	30	20	34.5	0041	0129	0217	22	5.21	2	9	800	-38	+12	+15	T1
56	10	30	20	34.5	0042	0130	0218	22	5.21	2	9	800	-38	+12	+15	T1
220	20	30	20	34.5	0043	0131	0219	42	2.53	3	16	1200	-60	+13	+16	T2
220	10	30	20	34.5	0044	0132	0220	42	2.53	3	16	1200	-60	+13	+16	T2
470	20	30	20	34.5	0045	0133	0221	64	1.81	8	32	1500	-65	+20	+25	T3
470	10	30	20	34.5	0046	0134	0222	64	1.81	8	32	1500	-65	+20	+25	T3
560	20	30	20	34.5	0047	0135	0223	55	1.30	9	36	2000	-65	+25	+30	T4
560	10	30	20	34.5	0048	0136	0224	55	1.30	9	36	2000	-65	+25	+30	T4
33	20	50	30	57.5	0049	0137	0225	12.3	4.95	2	9	700	-29	+10	+12	T1
33	10	50	30	57.5	0050	0138	0226	12.3	4.95	2	9	700	-29	+10	+12	T1
120	20	50	30	57.5	0051	0139	0227	22.5	2.49	4	24	1200	-42	+12	+15	T2
120	10	50	30	57.5	0052	0140	0228	22.5	2.49	4	24	1200	-42	+12	+15	T2
270	20	50	30	57.5	0053	0141	0229	37	1.82	8	32	1450	-46	+20	+25	T3
270	10	50	30	57.5	0054	0142	0230	37	1.82	8	32	1450	-46	+20	+25	T3
330	20	50	30	57.5	0055	0143	0231	38	1.53	9	36	1900	-46	+25	+30	T4
330	10	50	30	57.5	0056	0144	0232	38	1.53	9	36	1900	-46	+25	+30	T4
27	20	60	40	69	0057	0145	0233	10.2	5.01	3	12	700	-24	+10	+12	T1
27	10	60	40	69	0058	0146	0234	10.2	5.01	3	12	700	-24	+10	+12	T1
100	20	60	40	69	0059	0147	0235	19	2.52	4	20	1100	-36	+12	+15	T2
100	10	60	40	69	0060	0148	0236	19	2.52	4	20	1100	-36	+12	+15	T2
220	20	60	40	69	0061	0149	0237	30	1.81	8	32	1400	-40	+16	+20	T3
220	10	60	40	69	0062	0150	0238	30	1.81	8	32	1400	-40	+16	+20	T3
270	20	60	40	69	0063	0151	0239	27	1.33	9	36	1850	-45	+20	+25	T4
270	10	60	40	69	0064	0152	0240	27	1.33	9	36	1850	-45	+20	+25	T4
22	20	75	50	86.2	0065	0153	0241	8.5	5.13	3	12	600	-19	+10	+12	T1
22	10	75	50	86.2	0066	0154	0242	8.5	5.13	3	12	600	-19	+10	+12	T1
82	20	75	50	86.2	0067	0155	0243	15.2	2.46	4	24	1000	-30	+12	+15	T2
82	10	75	50	86.2	0068	0156	0244	15.2	2.46	4	24	1000	-30	+12	+15	T2
180	20	75	50	86.2	0069	0157	0245	24.4	1.80	9	36	1300	-35	+16	+20	T3
180	10	75	50	86.2	0070	0158	0246	24.4	1.80	9	36	1300	-35	+16	+20	T3
220	20	75	50	86.2	0071	0159	0247	37	2.23	10	40	1800	-40	+20	+25	T4
220	10	75	50	86.2	0072	0160	0248	37	2.23	10	40	1800	-40	+20	+25	T4
10	20	100	65	115	0073	0161	0249	4.5	5.97	3	12	800	-17	+10	+12	T1
10	10	100	65	115	0074	0162	0250	4.5	5.97	3	12	800	-17	+10	+12	T1
39	20	100	65	115	0075	0163	0251	10.4	3.54	5	24	1300	-20	+12	+15	T2
39	10	100	65	115	0076	0164	0252	10.4	3.54	5	24	1300	-20	+12	+15	T2
68	20	100	65	115	0077	0165	0253	11.3	2.21	10	40	1600	-30	+14	+16	T3
68	10	100	65	115	0078	0166	0254	11.3	2.21	10	40	1600	-30	+14	+16	T3
120	20	100	65	115	0079	0167	0255	25	2.76	12	48	2000	-35	+15	+17	T4
120	10	100	65	115	0080	0168	0256	25	2.76	12	48	2000	-35	+15	+17	T4
6.8	20	125	85	144	0081	0169	0257	6	11.71	3	12	700	-14	+10	+12	T1
6.8	10	125	85	144	0082	0170	0258	6	11.71	3	12	700	-14	+10	+12	T1
27	20	125	85	144	0083	0171	0259	7.2	3.54	5	24	1200	-18	+12	+15	T2
27	10	125	85	144	0084	0172	0260	7.2	3.54	5	24	1200	-18	+12	+15	T2
47	20	125	85	144	0085	0173	0261	7.9	2.23	10	40	1500	-26	+14	+16	T3
47	10	125	85	144	0086	0174	0262	7.9	2.23	10	40	1500	-26	+14	+16	T3
82	20	125	85	144	0087	0175	0263	17.4	2.82	12	48	1900	-30	+15	+17	T4
82	10	125	85	144	0088	0176	0264	17.4	2.82	12	48	1900	-30	+15	+17	T4

TO ORDER: **Indicate the prefix M39006/25 followed by the applicable MIL dash number Example: For M39006/25-0193 order M39006/250193. To obtain the optional vibration and shock requirements, add 'H' (M39006/250193H)**

CLR90 (MIL-C-39006/30)
Wet Tantalum Capacitors

MALLORY



- All Tantalum Case
- Hermetically Sealed
- Up to 3 Volts Reverse Capability
- **Lower ESR Than CLR79**
- Rugged Construction
- Failure Rate Levels M, P and R

GENERAL SPECIFICATIONS

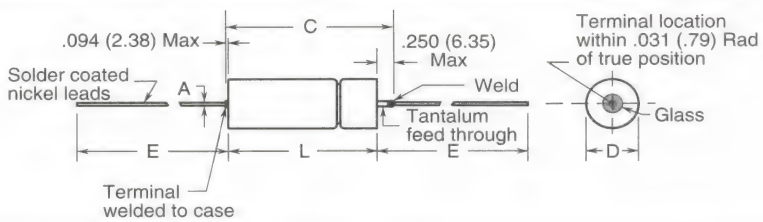
Operating Temperature:
55°C to +125°C
with voltage derated

Voltage Range:
6 to 125 VDC

Capacitance Range:
1.7 μF to 1200 μF

Tolerance Range:
±10%, ±20%
(±5% by special order)

Case Sizes: (Four)
.188 x.453 to .375 x 1.062



DIMENSIONS

Case Code	INCHES Uninsulated D ±.016	L +.031, -.016	Insulated D Max	L Max	C Max	A Lead Dia Nom	AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)	Case Code	MILLIMETERS Uninsulated D ±.41	L +.79, -.41	Insulated D Max	L Max	C Max	A Lead Dia Nom	AWG	E Lead Lgth ±6.35
T1	.188	.453	.219	.608	.734	.025	#22	1.500	2.0	T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
T2	.281	.641	.312	.796	.922	.025	#22	2.250	4.5	T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
T3	.375	.766	.406	.921	1.047	.025	#22	2.250	8.0	T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	12.0	T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

Cap (μF)	Cap Tol (±)	Maximum Working Voltage +85°C	+125°C	Surge Voltage @ +85°C	Part Number MIL-C-39006/30 Failure Rate Level % / 1,000 Hrs M (1.0)	P (0.1)	R (0.01)	Max DF (%)	Max ESR Ω @ +25°C	Maximum DC Leakage (μA) +25°C	+85°C & +125°C	Max Ripple @ 85°C 40kHz (mA)	Maximum % Capacitance Change from Room Temperature -55°C	+85°C	+125°C	Case Code
30	20	6	4	6.9	0001	0221	0441	4.5	1.99	1	2	820	-40	+10.5	+12	T1
30	10	6	4	6.9	0002	0222	0442	4.5	1.99	1	2	820	-40	+10.5	+12	T1
68	20	6	4	6.9	0004	0224	0444	7.5	1.58	1	2	960	-40	+14	+16	T1
68	10	6	4	6.9	0005	0225	0445	7.5	1.58	1	2	960	-40	+14	+16	T1
140	20	6	4	6.9	0007	0227	0447	10.5	.99	1	3	1200	-40	+14	+16	T2
140	10	6	4	6.9	0008	0228	0448	10.5	.99	1	3	1200	-40	+14	+16	T2
270	20	6	4	6.9	0010	0230	0450	22.5	1.11	1	6.5	1375	-44	+17.5	+20	T2
270	10	6	4	6.9	0011	0231	0451	22.5	1.11	1	6.5	1375	-44	+17.5	+20	T2
330	20	6	4	6.9	0013	0233	0453	18	.73	2	7.9	1800	-44	+14	+16	T3
330	10	6	4	6.9	0014	0234	0454	18	.73	2	7.9	1800	-44	+14	+16	T3
560	20	6	4	6.9	0016	0236	0456	27.5	.65	2	13	1900	-64	+17.5	+20	T3
560	10	6	4	6.9	0017	0237	0457	27.5	.65	2	13	1900	-64	+17.5	+20	T3
1200	20	6	4	6.9	0019	0239	0459	45	.50	3	14	2265	-80	+25	+25	T4
1200	10	6	4	6.9	0020	0240	0460	45	.50	3	14	2265	-80	+25	+25	T4
25	20	8	5	9.2	0021	0241	0461	3.75	1.99	1	2	820	-40	+10.5	+12	T1
25	10	8	5	9.2	0022	0242	0462	3.75	1.99	1	2	820	-40	+10.5	+12	T1
56	20	8	5	9.2	0024	0244	0464	7	1.66	1	2	900	-40	+14	+16	T1
56	10	8	5	9.2	0025	0245	0465	7	1.66	1	2	900	-40	+14	+16	T1
120	20	8	5	9.2	0027	0247	0467	10	1.11	1	2	1220	-44	+17.5	+20	T2
120	10	8	5	9.2	0028	0248	0468	10	1.11	1	2	1220	-44	+17.5	+20	T2
220	20	8	5	9.2	0030	0250	0470	18.5	1.12	1	7	1370	-44	+17.5	+20	T2
220	10	8	5	9.2	0031	0251	0471	18.5	1.12	1	7	1370	-44	+17.5	+20	T2
290	20	8	5	9.2	0033	0253	0473	17	.78	2	6	1770	-64	+17.5	+20	T3
290	10	8	5	9.2	0034	0254	0474	17	.78	2	6	1770	-64	+17.5	+20	T3
430	20	8	5	9.2	0036	0256	0476	23	.71	2	14	1825	-64	+17.5	+20	T3
430	10	8	5	9.2	0037	0257	0477	23	.71	2	14	1825	-64	+17.5	+20	T3
850	20	8	5	9.2	0039	0259	0479	30	.47	4	16	2330	-80	+25	+25	T4
850	10	8	5	9.2	0040	0260	0480	30	.47	4	16	2330	-80	+25	+25	T4

TO ORDER: **Indicate the prefix M39006/30 followed by the applicable MIL dash number Example: For M39006/30-0251 order M39006/300251. To obtain the optional vibration and shock requirements, add 'H' (M39006/300251H)**

CLR90 (MIL-C-39006/30)
Wet Tantalum Capacitors

MALLORY

Cap (µF)	Cap Tol (±)	Maximum Working Voltage		Surge Voltage @ +85°C	Part Number MIL-C-39006/30 Failure Rate Level % / 1,000 Hrs			Max DF (%)	Max ESR Ω @ +25°C	Maximum DC Leakage (µA)		Max Ripple @ 85°C 40kHz (mA)	Maximum % Capacitance Change from Room Temperature			Case Code
		+85°C	+125°C		M (1.0)	P (0.1)	R (0.01)			+25°C	+85°C & +125°C		-55°C	+85°C	+125°C	
20	20	10	7	11.5	0041	0261	0481	3	1.99	1	2	820	-32	+10.5	+12	T1
20	10	10	7	11.5	0042	0262	0482	3	1.99	1	2	820	-32	+10.5	+12	T1
47	20	10	7	11.5	0044	0264	0484	6.5	1.84	1	2	855	-36	+14	+16	T1
47	10	10	7	11.5	0045	0265	0485	6.5	1.84	1	2	855	-36	+14	+16	T1
100	20	10	7	11.5	0047	0267	0487	7.5	.99	1	4	1200	-36	+14	+16	T2
100	10	10	7	11.5	0048	0268	0488	7.5	.99	1	4	1200	-36	+14	+16	T2
180	20	10	7	11.5	0050	0270	0490	15	1.11	1	7	1365	-36	+14	+16	T2
180	10	10	7	11.5	0051	0271	0491	15	1.11	1	7	1365	-36	+14	+16	T2
250	20	10	7	11.5	0053	0273	0493	15	.80	2	10	1720	-40	+14	+16	T3
250	10	10	7	11.5	0054	0274	0494	15	.80	2	10	1720	-40	+14	+16	T3
390	20	10	7	11.5	0056	0276	0496	22	.75	2	16	1800	-64	+17.5	+20	T3
390	10	10	7	11.5	0057	0277	0497	22	.75	2	16	1800	-64	+17.5	+20	T3
750	20	10	7	11.5	0059	0279	0499	25	.44	4	16	2360	-80	+25	+25	T4
750	10	10	7	11.5	0060	0280	0500	25	.44	4	16	2360	-80	+25	+25	T4
15	20	15	10	17.2	0061	0281	0501	2.5	2.21	1	2	780	-24	+10.5	+12	T1
15	10	15	10	17.2	0062	0282	0502	2.5	2.21	1	2	780	-24	+10.5	+12	T1
33	20	15	10	17.2	0064	0284	0504	5	2.01	1	2	820	-28	+14	+16	T1
33	10	15	10	17.2	0065	0285	0505	5	2.01	1	2	820	-28	+14	+16	T1
70	20	15	10	17.2	0067	0287	0507	6.5	1.23	1	4	1150	-28	+14	+16	T2
70	10	15	10	17.2	0068	0288	0508	6.5	1.23	1	4	1150	-28	+14	+16	T2
120	20	15	10	17.2	0070	0290	0510	9	.99	1	7	1450	-28	+17.5	+20	T2
120	10	15	10	17.2	0071	0291	0511	9	.99	1	7	1450	-28	+17.5	+20	T2
170	20	15	10	17.2	0073	0293	0513	12.5	.98	2	10	1480	-32	+14	+16	T3
170	10	15	10	17.2	0074	0294	0514	12.5	.98	2	10	1480	-32	+14	+16	T3
270	20	15	10	17.2	0076	0296	0516	16	.79	2	16	1740	-56	+17.5	+20	T3
270	10	15	10	17.2	0077	0297	0517	16	.79	2	16	1740	-56	+17.5	+20	T3
540	20	15	10	17.2	0079	0299	0519	20	.49	6	24	2300	-80	+25	+25	T4
540	10	15	10	17.2	0080	0300	0520	20	.49	6	24	2300	-80	+25	+25	T4
10	20	25	15	28.8	0081	0301	0521	2	2.66	1	2	715	-16	+8	+9	T1
10	10	25	15	28.8	0082	0302	0522	2	2.66	1	2	715	-16	+8	+9	T1
22	20	25	15	28.8	0084	0304	0524	3.3	1.99	1	2	825	-20	+10.5	+12	T1
22	10	25	15	28.8	0085	0305	0525	3.3	1.99	1	2	825	-20	+10.5	+12	T1
50	20	25	15	28.8	0087	0307	0527	5.5	1.46	1	2	1130	-28	+13	+15	T2
50	10	25	15	28.8	0088	0308	0528	5.5	1.46	1	2	1130	-28	+13	+15	T2
100	20	25	15	28.8	0090	0310	0530	7.5	.99	1	10	1435	-28	+13	+15	T2
100	10	25	15	28.8	0091	0311	0531	7.5	.99	1	10	1435	-28	+13	+15	T2
120	20	25	15	28.8	0093	0313	0533	10.5	1.16	2	6	1450	-32	+13	+15	T3
120	10	25	15	28.8	0094	0314	0534	10.5	1.16	2	6	1450	-32	+13	+15	T3
180	20	25	15	28.8	0096	0316	0536	13	.96	2	18	1525	-48	+13	+15	T3
180	10	25	15	28.8	0097	0317	0537	13	.96	2	18	1525	-48	+13	+15	T3
350	20	25	15	28.8	0099	0319	0539	17.5	.67	7	28	1970	-70	+25	+25	T4
350	10	25	15	28.8	0100	0320	0540	17.5	.67	7	28	1970	-70	+25	+25	T4
8	20	30	20	34.5	0101	0321	0541	2	3.32	1	2	640	-16	+8	+12	T1
8	10	30	20	34.5	0102	0322	0542	2	3.32	1	2	640	-16	+8	+12	T1
15	20	30	20	34.5	0104	0324	0544	2.5	2.21	1	2	780	-20	+10.5	+12	T1
15	10	30	20	34.5	0105	0325	0545	2.5	2.21	1	2	780	-20	+10.5	+12	T1
40	20	30	20	34.5	0107	0327	0547	5	1.66	1	5	1120	-24	+10.5	+12	T2
40	10	30	20	34.5	0108	0328	0548	5	1.66	1	5	1120	-24	+10.5	+12	T2
68	20	30	20	34.5	0110	0330	0550	6.5	1.27	1	8	1285	-24	+13	+15	T2
68	10	30	20	34.5	0111	0331	0551	6.5	1.27	1	8	1285	-24	+13	+15	T2
100	20	30	20	34.5	0113	0333	0553	8.5	1.13	2	12	1450	-28	+10.5	+12	T3
100	10	30	20	34.5	0114	0334	0554	8.5	1.13	2	12	1450	-28	+10.5	+12	T3
150	20	30	20	34.5	0116	0336	0556	11.5	1.02	2	18	1525	-48	+13	+15	T3
150	10	30	20	34.5	0117	0337	0557	11.5	1.02	2	18	1525	-48	+13	+15	T3
300	20	30	20	34.5	0119	0339	0559	15.5	.69	8	32	1950	-60	+25	+25	T4
300	10	30	20	34.5	0120	0340	0560	15.5	.69	8	32	1950	-60	+25	+25	T4
5	20	50	30	57.5	0121	0341	0561	1.5	3.98	1	2	580	-16	+5	+6	T1
5	10	50	30	57.5	0122	0342	0562	1.5	3.98	1	2	580	-16	+5	+6	T1
10	20	50	30	57.5	0124	0344	0564	2	2.66	1	2	715	-24	+8	+9	T1
10	10	50	30	57.5	0125	0345	0565	2	2.66	1	2	715	-24	+8	+9	T1
25	20	50	30	57.5	0127	0347	0567	4	2.13	1	5	1005	-20	+10.5	+12	T2
25	10	50	30	57.5	0128	0348	0568	4	2.13	1	5	1005	-20	+10.5	+12	T2
47	20	50	30	57.5	0130	0350	0570	5.5	1.56	1	9	1155	-28	+13	+15	T2
47	10	50	30	57.5	0131	0351	0571	5.5	1.56	1	9	1155	-28	+13	+15	T2

TO ORDER: **Indicate the prefix M39006/30 followed by the applicable MIL dash number Example: For M39006/30-0251 order M39006/300251. To obtain the optional vibration and shock requirements, add 'H' (M39006/300251H)**

CLR90 (MIL-C-39006/30)
Wet Tantalum Capacitors

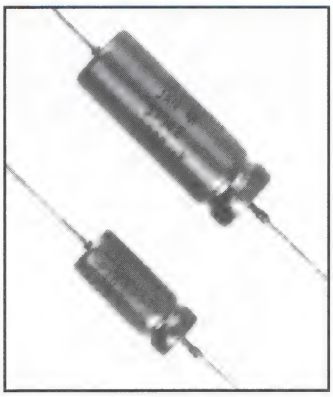
MALLORY

Cap (µF)	Cap Tol (±)	Maximum Working Voltage		Surge Voltage @	Part Number MIL-C-39006/30 Failure Rate Level % / 1,000 Hrs			Max DF	Max ESR Ω @	Maximum DC Leakage (µA)		Max Ripple @ 85°C 40kHz	Maximum % Capacitance Change from Room Temperature			Case Code
		+85°C	+125°C	+85°C	M (1.0)	P (0.1)	R (0.01)	(%)	+25°C	+25°C	+85°C & +125°C	(mA)	-55°C	+85°C	+125°C	
60	20	50	30	57.5	0133	0353	0573	6	1.33	2	12	1335	-16	+10.5	+12	T3
60	10	50	30	57.5	0134	0354	0574	6	1.33	2	12	1335	-16	+10.5	+12	T3
82	20	50	30	57.5	0136	0356	0576	7.5	1.22	2	16	1400	-32	+13	+15	T3
82	10	50	30	57.5	0137	0357	0577	7.5	1.22	2	16	1400	-32	+13	+15	T3
160	20	50	30	57.5	0139	0359	0579	8.5	.71	8	32	1900	-50	+25	+25	T4
160	10	50	30	57.5	0140	0360	0580	8.5	.71	8	32	1900	-50	+25	+25	T4
4	20	60	40	69	0141	0361	0581	1.4	4.65	1	2	525	-16	+5	+6	T1
4	10	60	40	69	0142	0362	0582	1.4	4.65	1	2	525	-16	+5	+6	T1
8.2	20	60	40	69	0144	0364	0584	2	3.24	1	2	625	-24	+8	+9	T1
8.2	10	60	40	69	0145	0365	0585	2	3.24	1	2	625	-24	+8	+9	T1
20	20	60	40	69	0147	0367	0587	3.5	2.32	1	5	930	-16	+10.5	+12	T2
20	10	60	40	69	0148	0368	0588	3.5	2.32	1	5	930	-16	+10.5	+12	T2
39	20	60	40	69	0150	0370	0590	5	1.70	1	9	1110	-28	+10.5	+12	T2
39	10	60	40	69	0151	0371	0591	5	1.70	1	9	1110	-28	+10.5	+12	T2
50	20	60	40	69	0153	0373	0593	5	1.33	2	12	1330	-16	+10.5	+12	T3
50	10	60	40	69	0154	0374	0594	5	1.33	2	12	1330	-16	+10.5	+12	T3
68	20	60	40	69	0156	0376	0596	6.5	1.27	2	16	1365	-32	+10.5	+12	T3
68	10	60	40	69	0157	0377	0597	6.5	1.27	2	16	1365	-32	+10.5	+12	T3
140	20	60	40	69	0159	0379	0599	8	.76	8	32	1850	-40	+20	+20	T4
140	10	60	40	69	0160	0380	0600	8	.76	8	32	1850	-40	+20	+20	T4
3.5	20	75	50	86.2	0161	0381	0601	1.25	4.74	1	2	525	-16	+5	+6	T1
3.5	10	75	50	86.2	0162	0382	0602	1.25	4.74	1	2	525	-16	+5	+6	T1
6.8	20	75	50	86.2	0164	0384	0604	1.75	3.42	1	2	610	-20	+8	+9	T1
6.8	10	75	50	86.2	0165	0385	0605	1.75	3.42	1	2	610	-20	+8	+9	T1
15	20	75	50	86.2	0167	0387	0607	3	2.66	1	5	890	-16	+8	+9	T2
15	10	75	50	86.2	0168	0388	0608	3	2.66	1	5	890	-16	+8	+9	T2
33	20	75	50	86.2	0170	0390	0610	5	2.01	1	10	1000	-24	+10.5	+15	T2
33	10	75	50	86.2	0171	0391	0611	5	2.01	1	10	1000	-24	+10.5	+15	T2
40	20	75	50	86.2	0173	0393	0613	4.5	1.50	2	12	1250	-16	+10.5	+12	T3
40	10	75	50	86.2	0174	0394	0614	4.5	1.50	2	12	1250	-16	+10.5	+12	T3
56	20	75	50	86.2	0176	0396	0616	5.5	1.31	2	17	1335	-28	+10.5	+15	T3
56	10	75	50	86.2	0177	0397	0617	5.5	1.31	2	17	1335	-28	+10.5	+15	T3
110	20	75	50	86.2	0179	0399	0619	6	.73	9	36	1850	-35	+20	+20	T4
110	10	75	50	86.2	0180	0400	0620	6	.73	9	36	1850	-35	+20	+20	T4
2.5	20	100	65	115	0181	0401	0621	1	5.31	1	2	505	-16	+7	+8	T1
2.5	10	100	65	115	0182	0402	0622	1	5.31	1	2	505	-16	+7	+8	T1
4.7	20	100	65	115	0184	0404	0624	1.5	4.24	1	2	565	-16	+7	+8	T1
4.7	10	100	65	115	0185	0405	0625	1.5	4.24	1	2	565	-16	+7	+8	T1
11	20	100	65	115	0187	0407	0627	2.5	3.02	1	4	835	-16	+8	+8	T2
11	10	100	65	115	0188	0408	0628	2.5	3.02	1	4	835	-16	+8	+8	T2
22	20	100	65	115	0190	0410	0630	3.75	2.26	1	9	965	-16	+8	+8	T2
22	10	100	65	115	0191	0411	0631	3.75	2.26	1	9	965	-16	+8	+8	T2
30	20	100	65	115	0193	0413	0633	3.5	1.55	2	12	1240	-16	+8	+8	T3
30	10	100	65	115	0194	0414	0634	3.5	1.55	2	12	1240	-16	+8	+8	T3
43	20	100	65	115	0196	0416	0636	4.25	1.31	2	17	1335	-20	+8	+8	T3
43	10	100	65	115	0197	0417	0637	4.25	1.31	2	17	1335	-20	+8	+8	T3
86	20	100	65	115	0199	0419	0639	5	.77	9	36	1800	-25	+15	+15	T4
86	10	100	65	115	0200	0420	0640	5	.77	9	36	1800	-25	+15	+15	T4
1.7	20	125	85	144	0201	0421	0641	1	7.81	1	2	415	-16	+7	+8	T1
1.7	10	125	85	144	0202	0422	0642	1	7.81	1	2	415	-16	+7	+8	T1
3.6	20	125	85	144	0204	0424	0644	1.35	4.98	1	2	520	-16	+7	+8	T1
3.6	10	125	85	144	0205	0425	0645	1.35	4.98	1	2	520	-16	+7	+8	T1
9	20	125	85	144	0207	0427	0647	2.5	3.69	1	5	755	-16	+7	+8	T2
9	10	125	85	144	0208	0428	0648	2.5	3.69	1	5	755	-16	+7	+8	T2
14	20	125	85	144	0210	0430	0650	3	2.85	1	7	860	-16	+7	+8	T2
14	10	125	85	144	0211	0431	0651	3	2.85	1	7	860	-16	+7	+8	T2
18	20	125	85	144	0213	0433	0653	2.5	1.85	2	9	1130	-16	+7	+8	T3
18	10	125	85	144	0214	0434	0654	2.5	1.85	2	9	1130	-16	+7	+8	T3
25	20	125	85	144	0216	0436	0656	3	1.59	2	13	1200	-16	+7	+8	T3
25	10	125	85	144	0217	0437	0657	3	1.59	2	13	1200	-16	+7	+8	T3
56	20	125	85	144	0219	0439	0659	3.25	.77	10	40	1800	-25	+15	+15	T4
56	10	125	85	144	0220	0440	0660	3.25	.77	10	40	1800	-25	+15	+15	T4

TO ORDER: **Indicate the prefix M39006/30 followed by the applicable MIL dash number Example: For M39006/30-0251 order M39006/300251. To obtain the optional vibration and shock requirements, add 'H' (M39006/300251H)**

CLR91 (MIL-C-39006/31)
Wet Tantalum Capacitors

MALLORY



- Extended Range
- All Tantalum Case
- Hermetically Sealed
- Up to 3 Volts Reverse Capability
- Highest CV per Case Size
- **Lower ESR Than CLR81**
- Rugged Construction
- Failure Rate Levels M, P and R

GENERAL SPECIFICATIONS

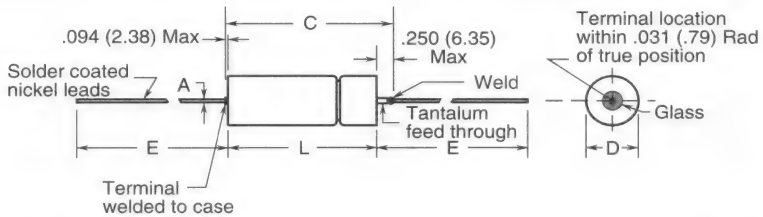
Operating Temperature:
-55°C to +125°C
with voltage derated

Voltage Range:
6 to 125 VDC

Capacitance Range:
6.8 μF to 2200 μF

Tolerance Range:
±10%, ±20%

Case Sizes: (Four)
.188 x.453 to .375 x 1.062



DIMENSIONS

Case Code	INCHES Uninsulated D ±.016	Uninsulated L +.031, -.016	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±.250	Approximate Weight (Grams) (1 gram = .035 Oz.)	Case Code	MILLIMETERS Uninsulated D ±.41	Uninsulated L +.79, -.41	Insulated D Max	Insulated L Max	C Max	A Lead Dia Nom	A Lead Dia AWG	E Lead Lgth ±6.35
T1	.188	.453	.219	.608	.734	.025	#22	1.500	2.0	T1	4.78	11.51	5.56	15.45	18.64	.64	#22	38.10
T2	.281	.641	.312	.796	.922	.025	#22	2.250	5.5	T2	7.14	16.28	7.92	20.22	23.41	.64	#22	57.15
T3	.375	.766	.406	.921	1.047	.025	#22	2.250	10.0	T3	9.53	19.46	10.31	23.40	26.59	.64	#22	57.15
T4	.375	1.062	.406	1.217	1.343	.025	#22	2.250	16.0	T4	9.53	26.97	10.31	30.91	34.11	.64	#22	57.15

Cap (μF)	Cap Tol (±)	Maximum Working Voltage @ +85°C	Maximum Working Voltage @ +125°C	Surge Voltage @ +85°C	Part Number MIL-C-39006/31 Failure Rate Level % / 1,000 Hrs M (1.0)	P (0.1)	R (0.01)	Max DF (%)	Max ESR Ω @ +25°C	Maximum DC Leakage (μA) +25°C	+85°C & +125°C	Max Ripple @ 85°C 40kHz (mA)	Maximum % Capacitance Change from Room Temperature -55°C	+85°C	+125°C	Case Code
220	20	6	4	6.9	0001	0089	0177	25	1.51	2	9	1000	-64	+13	+16	T1
220	10	6	4	6.9	0002	0090	0178	25	1.51	2	9	1000	-64	+13	+16	T1
820	20	6	4	6.9	0003	0091	0179	77.5	1.26	3	14	1500	-88	+16	+20	T2
820	10	6	4	6.9	0004	0092	0180	77.5	1.26	3	14	1500	-88	+16	+20	T2
1500	20	6	4	6.9	0005	0093	0181	86	.76	5	20	1900	-90	+20	+25	T3
1500	10	6	4	6.9	0006	0094	0182	86	.76	5	20	1900	-90	+20	+25	T3
2200	20	6	4	6.9	0007	0095	0183	85	.52	6	24	2300	-90	+25	+30	T4
2200	10	6	4	6.9	0008	0096	0184	85	.52	6	24	2300	-90	+25	+30	T4
180	20	8	5	9.2	0009	0097	0185	20.5	1.51	2	9	1000	-60	+13	+16	T1
180	10	8	5	9.2	0010	0098	0186	20.5	1.51	2	9	1000	-60	+13	+16	T1
680	20	8	5	9.2	0011	0099	0187	65	1.27	3	14	1500	-83	+16	+20	T2
680	10	8	5	9.2	0012	0100	0188	65	1.27	3	14	1500	-83	+16	+20	T2
1500	20	8	5	9.2	0013	0101	0189	85	.75	5	20	1900	-90	+20	+25	T3
1500	10	8	5	9.2	0014	0102	0190	85	.75	5	20	1900	-90	+20	+25	T3
1800	20	8	5	9.2	0015	0103	0191	69	.51	7	25	2300	-90	+25	+30	T4
1800	10	8	5	9.2	0016	0104	0192	69	.51	7	25	2300	-90	+25	+30	T4
150	20	10	7	11.5	0017	0105	0193	17	1.51	2	9	900	-55	+13	+16	T1
150	10	10	7	11.5	0018	0106	0194	17	1.51	2	9	900	-55	+13	+16	T1
560	20	10	7	11.5	0019	0107	0195	53	1.26	3	16	1450	-77	+16	+20	T2
560	10	10	7	11.5	0020	0108	0196	53	1.26	3	16	1450	-77	+16	+20	T2
1200	20	10	7	11.5	0021	0109	0197	68.5	.76	5	20	1850	-88	+20	+25	T3
1200	10	10	7	11.5	0022	0110	0198	68.5	.76	5	20	1850	-88	+20	+25	T3
1500	20	10	7	11.5	0023	0111	0199	57	.51	7	25	2300	-88	+25	+30	T4
1500	10	10	7	11.5	0024	0112	0200	57	.51	7	25	2300	-88	+25	+30	T4
100	20	15	10	17.2	0025	0113	0201	15	1.99	2	9	900	-44	+13	+16	T1
100	10	15	10	17.2	0026	0114	0202	15	1.99	2	9	900	-44	+13	+16	T1

TO ORDER: **Indicate the prefix M39006/31 followed by the applicable MIL dash number Example: For M39006/31-0193 order M39006/310193. To obtain the optional vibration and shock requirements, add 'H' (M39006/310193H)**

CLR91 (MIL-C-39006/31)
Wet Tantalum Capacitors

MALLORY

Cap (µF)	Cap Tol (±)	Maximum Working Voltage		Surge Voltage @ +85°C	Part Number MIL-C-39006/31 Failure Rate Level % / 1,000 Hrs			Max DF	Max ESR Ω @ +25°C	Maximum DC Leakage (µA)		Max Ripple @ 85°C 40kHz (mA)	Maximum % Capacitance Change from Room Temperature			Case Code
		+85°C	+125°C		M (1.0)	P (0.1)	R (0.01)	(%)		+25°C	+85°C & +125°C		-55°C	+85°C	+125°C	
390	20	15	10	17.2	0027	0115	0203	37	1.26	3	16	1450	-66	+16	+20	T2
390	10	15	10	17.2	0028	0116	0204	37	1.26	3	16	1450	-66	+16	+20	T2
820	20	15	10	17.2	0029	0117	0205	55.5	.90	6	24	1800	-77	+20	+25	T3
820	10	15	10	17.2	0030	0118	0206	55.5	.90	6	24	1800	-77	+20	+25	T3
1000	20	15	10	17.2	0031	0119	0207	46	.61	8	32	2300	-77	+25	+30	T4
1000	10	15	10	17.2	0032	0120	0208	46	.61	8	32	2300	-77	+25	+30	T4
68	20	25	15	28.8	0033	0121	0209	11	2.15	2	9	850	-40	+12	+15	T1
68	10	25	15	28.8	0034	0122	0210	11	2.15	2	9	850	-40	+12	+15	T1
270	20	25	15	28.8	0035	0123	0211	27.5	1.35	3	16	1400	-62	+13	+16	T2
270	10	25	15	28.8	0036	0124	0212	27.5	1.35	3	16	1400	-62	+13	+16	T2
560	20	25	15	28.8	0037	0125	0213	38	.90	7	28	1750	-72	+20	+25	T3
560	10	25	15	28.8	0038	0126	0214	38	.90	7	28	1750	-72	+20	+25	T3
680	20	25	15	28.8	0039	0127	0215	31.5	.62	8	32	2100	-72	+25	+30	T4
680	10	25	15	28.8	0040	0128	0216	31.5	.62	8	32	2100	-72	+25	+30	T4
56	20	30	20	34.5	0041	0129	0217	11	2.61	2	9	800	-38	+12	+15	T1
56	10	30	20	34.5	0042	0130	0218	11	2.61	2	9	800	-38	+12	+15	T1
220	20	30	20	34.5	0043	0131	0219	21	1.27	3	16	1200	-60	+13	+16	T2
220	10	30	20	34.5	0044	0132	0220	21	1.27	3	16	1200	-60	+13	+16	T2
470	20	30	20	34.5	0045	0133	0221	32	.91	8	32	1500	-65	+20	+25	T3
470	10	30	20	34.5	0046	0134	0222	32	.91	8	32	1500	-65	+20	+25	T3
560	20	30	20	34.5	0047	0135	0223	27.5	.65	9	36	2000	-65	+25	+30	T4
560	10	30	20	34.5	0048	0136	0224	27.5	.65	9	36	2000	-65	+25	+30	T4
33	20	50	30	57.5	0049	0137	0225	6.15	2.48	2	9	700	-29	+10	+12	T1
33	10	50	30	57.5	0050	0138	0226	6.15	2.48	2	9	700	-29	+10	+12	T1
120	20	50	30	57.5	0051	0139	0227	11.25	1.25	4	24	1200	-42	+12	+15	T2
120	10	50	30	57.5	0052	0140	0228	11.25	1.25	4	24	1200	-42	+12	+15	T2
270	20	50	30	57.5	0053	0141	0229	18.5	.91	8	32	1450	-46	+20	+25	T3
270	10	50	30	57.5	0054	0142	0230	18.5	.91	8	32	1450	-46	+20	+25	T3
330	20	50	30	57.5	0055	0143	0231	19	.77	9	36	1900	-46	+25	+30	T4
330	10	50	30	57.5	0056	0144	0232	19	.77	9	36	1900	-46	+25	+30	T4
27	20	60	40	69	0057	0145	0233	5.1	2.51	3	12	700	-24	+10	+12	T1
27	10	60	40	69	0058	0146	0234	5.1	2.51	3	12	700	-24	+10	+12	T1
100	20	60	40	69	0059	0147	0235	9.5	1.26	4	20	1100	-36	+12	+15	T2
100	10	60	40	69	0060	0148	0236	9.5	1.26	4	20	1100	-36	+12	+15	T2
220	20	60	40	69	0061	0149	0237	15	.91	8	32	1400	-40	+16	+20	T3
220	10	60	40	69	0062	0150	0238	15	.91	8	32	1400	-40	+16	+20	T3
270	20	60	40	69	0063	0151	0239	13.5	.67	9	36	1850	-45	+20	+25	T4
270	10	60	40	69	0064	0152	0240	13.5	.67	9	36	1850	-45	+20	+25	T4
22	20	75	50	86.2	0065	0153	0241	4.25	2.57	3	12	600	-19	+10	+12	T1
22	10	75	50	86.2	0066	0154	0242	4.25	2.57	3	12	600	-19	+10	+12	T1
82	20	75	50	86.2	0067	0155	0243	7.6	1.23	4	24	1000	-30	+12	+15	T2
82	10	75	50	86.2	0068	0156	0244	7.6	1.23	4	24	1000	-30	+12	+15	T2
180	20	75	50	86.2	0069	0157	0245	12.2	.90	9	36	1300	-35	+16	+20	T3
180	10	75	50	86.2	0070	0158	0246	12.2	.90	9	36	1300	-35	+16	+20	T3
220	20	75	50	86.2	0071	0159	0247	18.5	1.12	10	40	1800	-40	+20	+25	T4
220	10	75	50	86.2	0072	0160	0248	18.5	1.12	10	40	1800	-40	+20	+25	T4
10	20	100	65	115	0073	0161	0249	2.25	2.99	3	12	800	-17	+10	+12	T1
10	10	100	65	115	0074	0162	0250	2.25	2.99	3	12	800	-17	+10	+12	T1
39	20	100	65	115	0075	0163	0251	5.2	1.77	5	24	1300	-20	+12	+15	T2
39	10	100	65	115	0076	0164	0252	5.2	1.77	5	24	1300	-20	+12	+15	T2
68	20	100	65	115	0077	0165	0253	5.65	1.11	10	40	1600	-30	+14	+16	T3
68	10	100	65	115	0078	0166	0254	5.65	1.11	10	40	1600	-30	+14	+16	T3
120	20	100	65	115	0079	0167	0255	12.5	1.38	12	48	2000	-35	+15	+17	T4
120	10	100	65	115	0080	0168	0256	12.5	1.38	12	48	2000	-35	+15	+17	T4
6.8	20	125	85	144	0081	0169	0257	3	5.86	3	12	700	-14	+10	+12	T1
6.8	10	125	85	144	0082	0170	0258	3	5.86	3	12	700	-14	+10	+12	T1
27	20	125	85	144	0083	0171	0259	3.6	1.77	5	24	1200	-18	+12	+15	T2
27	10	125	85	144	0084	0172	0260	3.6	1.77	5	24	1200	-18	+12	+15	T2
47	20	125	85	144	0085	0173	0261	3.95	1.12	10	40	1500	-26	+14	+16	T3
47	10	125	85	144	0086	0174	0262	3.95	1.12	10	40	1500	-26	+14	+16	T3
82	20	125	85	144	0087	0175	0263	8.7	1.41	12	48	1900	-30	+15	+17	T4
82	10	125	85	144	0088	0176	0264	8.7	1.41	12	48	1900	-30	+15	+17	T4

TO ORDER: **Indicate the prefix M39006/31 followed by the applicable MIL dash number Example: For M39006/31-0193 order M39006/310193. To obtain the optional vibration and shock requirements, add 'H' (M39006/310193H)**

Index
Solid Tantalum Capacitors

MALLORY

Type	Features	Capacitance Range	Voltage Range	Temperature Range	Tolerances (%)	Case Dimensions (Inches)	Page Number
Hermetically Sealed /Axial							
TAS	Low DC Leakage Temperature Stable Frequency Stable Commercial CSR13	.0047 μF to 330 μF	6 VDC to 100 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x L) .135 x .286 to .351 x .786	51
TXA	Extended Capacitance Low DC Leakage Temperature Stable Frequency Stable Commercial CSR23	1.2 μF to 1,000 μF	6 VDC to 50 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x L .135 x .286 to .351 x .786	53
THF	High Ripple Current Low Impedance Low ESR Temperature Stable Commercial CSR21	5.6 μF to 330 μF	6 VDC to 50 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x L) .289 x .686 to .351 x .786	54
Molded Case							
TAC	Axial Leads Taped and Reeled Highest CV per Case Automatic Insertion	0.1 μF to 330 μF	6 VDC to 50 VDC	-55°C +125°C (With proper derating)	±5 * ±10	(D x L) .095 x .260 to .300 x .710	64
TIM	Radial Leads Precision Molded Low DC Leakage Low ESR	0.1 μF to 220 μF	6 VDC to 50 VDC	-55°C +125°C (With proper derating)	±10 ±20	(H x W x T) .345 x .230 x .105 to .375 x .600 x .195	66
Dipped							
TDC	Radial Leads Low Cost Conformally Coated Low DCL & ESR Resistant to Shock and Vibration	0.1 μF to 330 μF	6 VDC to 50 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x H) .175 x .350 to .350 x .650 Lead Spacing: .125 and .250	68
TDL	Radial Leads Low Profile Conformally Coated Low DCL & ESR Resistant to Shock and Vibration	0.1 μF to 330 μF	6 VDC to 50 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x H) .180 x .280 to .440 x .680 Lead Spacing: .100 and .200	70
Surface Mount							
T491	Surface Mount Precision Molded Taped and Reeled EIA and IECQ Standards	0.1 μF to 220 μF	4 VDC to 50 VDC	-55°C +125°C (With proper derating)	±10 (±20 by special order only)	(L x W x H) .126 x .063 x .063 to .287 x .169 x .157	72
T492 (CWR11)	Mil-C-55365/8 Surface Mount Precision Molded Taped and Reeled EIA and IECQ Standards	0.1 μF to 47 μF	4 VDC to 35 VDC	-55°C +125°C (With proper derating)	±10 (±20 by special order only)	(L x W x H) .126 x .063 x .063 to .287 x .169 x .110	Contact NACC
T494	Surface Mount Very Low ESR Precision Molded Taped and Reeled EIA and IECQ Standards	0.68 μF to 470 μF	2.7 VDC to 20 VDC	-55°C +125°C (With proper derating)	±10 (±20 by special order only)	(L x W x H) .126 x .063 x .047 to .287 x .169 x .079	Contact NACC
T495	Surface Mount Very Low ESR Precision Molded Taped and Reeled EIA and IECQ Standards	4.7 μF to 150 μF	6 VDC to 50 VDC	-55°C +125°C (With proper derating)	±10 (±20 by special order only)	(L x W x H) .287 x .169 x .110 and .287 x .169 x .157	75
T496	Surface Mount Built-In Fuse Protection Precision Molded Taped and Reeled EIA and IECQ Standards	0.15 μF to 100 μF	4 VDC to 50 VDC	-55°C +125°C (With proper derating)	±10 (±20 by special order only)	(L x W x H) .138 x .110 x .075 and .287 x .169 x .157	Contact NACC

*** ±5 Tolerances by special order only.**

Index / Part Number Nomenclature
Solid Tantalum Capacitors

MALLORY

Military - Established Reliability Type

MIL Specification	MIL QPL Approvals Failure Rate Levels	Features	Capacitance Range	Voltage Range	Temperature Range	Tolerances (%)	Case Dimensions (Inches)	Page Number
M39003/01 CSR13	Exponential: M, P, R, S Weibull: B, C, D	Graded Reliability Low DC Leakage Temperature Stable Long Shelf Life	.0047 µF to 330 µF	6 VDC to 100 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x L) .135 x .286 to .351 x .786	55
M39003/02 CSR09	Exponential: M, P, R, S Weibull: B, C, D	Graded Reliability Miniature Long Shelf Life	.047 µF to 18 µF	6 VDC to 75 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x L) .090 x .250 to .138 x .390	Contact NACC
M39003/04 CSR91	Exponential: M, P, R, S Weibull: B, C, D	Non-Polar Graded Reliability Low DC Leakage Long Shelf Life	.0023 µF to 160 µF	6 VDC to 100 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x L) .161 x .575 to .376 x 1.550	Contact NACC
M39003/06 CSR33	Exponential: M, P, R, S Weibull: B, C, D	Extended Range Graded Reliability Low DC Leakage Long Shelf Life	1.2 µF to 1,000 µF	6 VDC to 50 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x L) .135 x .286 to .351 x .786	Contact NACC
M39003/09 CSR21	Exponential: M, P, R, S Weibull: B, C, D	High Ripple Current Low Impedance Low ESR Graded Reliability Low DC Leakage Long Shelf Life	5.6µF to 330 µF	6 VDC to 50 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x L) .289 x .686 to .351 x .786	60
M39003/03 CSR23	Exponential: M, P, R, S Weibull: B, C, D	Extended Capacitance Graded Reliability Low DC Leakage Long Shelf Life	1.2 µF to 1,000 µF	6 VDC to 50 VDC	-55°C +125°C (With proper derating)	±5 * ±10 ±20	(D x L) .135 x .286 to .351 x .786	62

*** ±5 Tolerances by special order only.**

Part Number Nomenclature

Metal Case

TAS	474	M	035	P	1	A
THF	157	K	006	P	1	F
TXA	186	M	020	P	1	C
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. TAS, THF, TXA Series - Metal Case Solid Tantalum
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 474 = 0.47 µF) (Example: 157 = 150 µF) (Example: 186 = 18 µF)
3. Capacitance Tolerance:
   K = ±10%, M = ±20%, (J = ±5%, special order only)
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. P = Polar
6. 1 = Mylar Sleeve
7. Case Size Code

Molded Case

TAC	107	K	006	P	0	7
TIM	335	M	025	P	0	W
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. TAC, TIM Series - Molded Case Solid Tantalum
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 107 = 100 µF) (Example: 335 = 3.3 µF)
3. Capacitance Tolerance:
   K = ±10%, M = ±20%, (J = ±5%, special order only)
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. P = Polar
6. 0 = Molded Epoxy Case
7. Case Size Code

Dipped - .125 & .250 Lead Spacing

TDC	395	K	015	N	S	E
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. TDC Series - Dipped Solid Tantalum
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 395 = 3.9 µF)
3. Capacitance Tolerance:
   K = ±10%, M = ±20%, (J = ±5%, special order only)
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. Lead Spacing
   N = .125
   W = .250
6. Leads
   S = .187 Length
7. Case Size Code

Dipped - .100 & .200 Lead Spacing

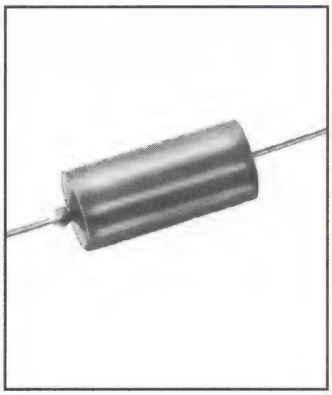
TDL	104	M	050	S	1	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. TDL Series - Dipped Solid Tantalum
2. Capacitance Code (Expressed in Picofarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 104 = 0.10 µF)
3. Capacitance Tolerance:
   K = ±10%, M = ±20%, (J = ±5%, special order only)
4. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
5. Lead Spacing
   S = .100
   M = .200
6. Leads
   1 = Straight .390 Long
   2 = Standoff .187 Long
7. Case Size Code

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type TAS
Solid Tantalum Capacitors

MALLORY



- Hermetically Sealed
- High Capacitance
- Low DC Leakage
- Low Dissipation Factor
- Temperature Stable
- Frequency Stable
- Moisture/Solvent Resistant
- Miniature Size
- Long Shelf Life

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(With proper derating)

Voltage Range:
6 to 100 WVDC @ 85°C

Reverse Voltage (Non-continuous):
15% of rated voltage @ 25°C
5% of rated voltage @ 85°C
1% of rated voltage @ 125°C

Capacitance Range:
.0047 μF to 330 μF

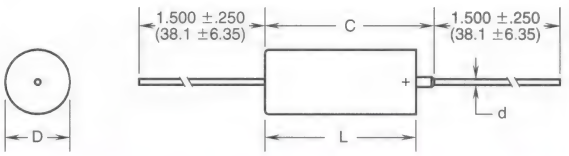
Capacitance Tolerance:
±10%, ±20%
(±5% by special order)

DC Leakage:
At +25°C - See Table Limit
At +85°C - 10 x Table Limit
At +125°C- 12.5 x Table Limit

Capacitance Change Maximum:
-10% @ -55°C
+8% @ +85°C
+12% @ +125°C

Maximum Power Dissipation @ 25°C:

Case Code	Watts
A	.09
C	.100
F	.125
G	.180



Case Code	Uninsulated D ±.005 (±.13)	Uninsulated L ±.031 (±.79)	Insulated D ±.010 (±.25)	Insulated L ±.031 (±.79)	C Maximum	d ±.001 (±.03)	Quantity Per Reel
A	.125(3.18)	.250(6.35)	.135(3.43)	.286(7.26)	.422(10.72)	.020(.51)	3,500
C	.175(4.45)	.438(11.13)	.185(4.70)	.474(12.04)	.610(15.49)	.020(.51)	2,500
F	.279(7.09)	.650(16.51)	.289(7.34)	.686(17.42)	.822(20.88)	.025(.64)	500
G	.341(8.66)	.750(19.05)	.351(8.92)	.786(19.96)	.922(23.42)	.025(.64)	400

6 WVDC @ 85°C 4 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
2.2	A	0.3	4	TAS225*006P1A
2.7	A	0.3	4	TAS275*006P1A
3.3	A	0.3	4	TAS335*006P1A
3.9	A	0.3	4	TAS395*006P1A
4.7	A	0.3	4	TAS475*006P1A
5.6	A	0.3	4	TAS565*006P1A
6.8	A	0.3	6	TAS685*006P1A
8.2	C	0.3	6	TAS825*006P1C
10	C	0.3	6	TAS106*006P1C
12	C	0.5	6	TAS126*006P1C
15	C	0.9	6	TAS156*006P1C
18	C	0.9	6	TAS186*006P1C
22	C	0.9	6	TAS226*006P1C
27	C	0.9	6	TAS276*006P1C
33	C	0.9	6	TAS336*006P1C
39	C	0.9	6	TAS396*006P1C
47	C	1.5	6	TAS476*006P1C
56	C	1.5	6	TAS566*006P1C
68	F	3.0	6	TAS686*006P1F
100	F	3.0	6	TAS107*006P1F
120	F	3.0	6	TAS127*006P1F
150	F	4.5	6	TAS157*006P1F
180	F	5.5	6	TAS187*006P1F
220	G	6.0	8	TAS227*006P1G
270	G	6.0	8	TAS277*006P1G
330	G	7.5	8	TAS337*006P1G

10 WVDC @ 85°C 7 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
1.0	A	0.3	3	TAS105*010P1A
1.2	A	0.3	4	TAS125*010P1A
1.5	A	0.3	4	TAS155*010P1A
1.8	A	0.3	4	TAS185*010P1A
2.2	A	0.3	4	TAS225*010P1A
2.7	A	0.3	4	TAS275*010P1A
3.3	A	0.3	4	TAS335*010P1A
3.9	A	0.3	4	TAS395*010P1A
4.7	A	0.4	4	TAS475*010P1A
5.6	C	0.4	4	TAS565*010P1C

10 WVDC @ 85°C 7 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
6.8	C	1.0	6	TAS685*010P1C
8.2	C	1.0	6	TAS825*010P1C
10	C	1.0	6	TAS106*010P1C
12	C	1.0	6	TAS126*010P1C
15	C	1.0	6	TAS156*010P1C
18	C	1.0	6	TAS186*010P1C
22	C	2.0	6	TAS226*010P1C
27	C	2.0	6	TAS276*010P1C
33	C	2.0	6	TAS336*010P1C
39	C	2.0	6	TAS396*010P1C
47	F	3.0	6	TAS476*010P1F
56	F	3.0	6	TAS566*010P1F
68	F	3.0	6	TAS686*010P1F
100	F	5.0	6	TAS107*010P1F
120	F	5.0	6	TAS127*010P1F
150	G	9.0	6	TAS157*010P1G
180	G	9.0	6	TAS187*010P1G
220	G	10.0	8	TAS227*010P1G

15 WVDC @ 85°C 10 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
0.39	A	0.3	3	TAS394*015P1A
0.47	A	0.3	3	TAS474*015P1A
0.56	A	0.3	3	TAS564*015P1A
0.68	A	0.3	3	TAS684*015P1A
0.82	A	0.3	3	TAS824*015P1A
1.0	A	0.3	3	TAS105*015P1A
1.2	A	0.3	4	TAS125*015P1A
1.5	A	0.3	4	TAS155*015P1A
1.8	A	0.3	4	TAS185*015P1A
2.2	A	0.3	4	TAS225*015P1A
2.7	A	0.3	4	TAS275*015P1A
3.3	A	0.4	4	TAS335*015P1A
3.9	C	0.4	4	TAS395*015P1C
4.7	C	0.7	4	TAS475*015P1C
5.6	C	0.7	4	TAS565*015P1C
6.8	C	0.7	6	TAS685*015P1C
8.2	C	0.7	6	TAS825*015P1C

15 WVDC @ 85°C 10 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
10	C	1.0	6	TAS106*015P1C
12	C	1.0	6	TAS126*015P1C
15	C	2.0	6	TAS156*015P1C
18	C	2.0	6	TAS186*015P1C
22	C	2.0	6	TAS226*015P1C
27	F	3.0	6	TAS276*015P1F
33	F	3.0	6	TAS336*015P1F
39	F	3.0	6	TAS396*015P1F
47	F	4.0	6	TAS476*015P1F
56	F	4.0	6	TAS566*015P1F
68	F	5.0	6	TAS686*015P1F
82	G	6.0	6	TAS826*015P1G
100	G	6.0	6	TAS107*015P1G
120	G	6.0	6	TAS127*015P1G
150	G	8.0	6	TAS157*015P1G

20 WVDC @ 85°C 13 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
0.047	A	0.1	3	TAS473*020P1A
0.056	A	0.1	3	TAS563*020P1A
0.068	A	0.1	3	TAS683*020P1A
0.082	A	0.1	3	TAS823*020P1A
0.10	A	0.3	3	TAS104*020P1A
0.12	A	0.3	3	TAS124*020P1A
0.15	A	0.3	3	TAS154*020P1A
0.18	A	0.3	3	TAS184*020P1A
0.22	A	0.3	3	TAS224*020P1A
0.27	A	0.3	3	TAS274*020P1A
0.39	A	0.3	3	TAS394*020P1A
0.47	A	0.3	3	TAS474*020P1A
0.56	A	0.3	3	TAS564*020P1A
0.68	A	0.3	3	TAS684*020P1A
0.82	A	0.3	3	TAS824*020P1A
1.0	A	0.3	3	TAS105*020P1A
1.2	A	0.3	4	TAS125*020P1A
1.5	A	0.3	4	TAS155*020P1A
1.8	A	0.3	4	TAS185*020P1A
2.2	A	0.4	4	TAS225*020P1A
2.7	C	0.5	4	TAS275*020P1C

* Indicate capacitance tolerance: J = 5±%, K = ±10%, M = ±20%

Type TAS
Solid Tantalum Capacitors

MALLORY

Cap (µF)	Case Code	Max DCL @ +25°C (µA)	Max D.F. % @+25°C 120 Hz	Catalog Number
20 WVDC @ 85°C 13 WVDC @ 125°C				
3.3	C	1.0	4	TAS335*020P1C
3.9	C	1.0	4	TAS395*020P1C
4.7	C	1.0	4	TAS475*020P1C
5.6	C	1.0	4	TAS565*020P1C
6.8	C	1.0	6	TAS685*020P1C
8.2	C	1.0	6	TAS825*020P1C
10	C	1.0	6	TAS106*020P1C
12	C	1.0	6	TAS126*020P1C
15	C	2.0	6	TAS156*020P1C
18	F	2.0	6	TAS186*020P1F
22	F	2.5	6	TAS226*020P1F
27	F	2.5	6	TAS276*020P1F
33	F	3.0	6	TAS336*020P1F
39	F	3.0	6	TAS396*020P1F
47	F	4.5	6	TAS476*020P1F
56	G	5.5	6	TAS566*020P1G
68	G	6.0	6	TAS686*020P1G
82	G	6.0	6	TAS826*020P1G
100	G	10.0	6	TAS107*020P1G
35 WVDC @ 85°C 23 WVDC @ 125°C				
0.0047	A	0.1	3	TAS472*035P1A
0.0056	A	0.1	3	TAS562*035P1A
0.0068	A	0.1	3	TAS682*035P1A
0.0082	A	0.1	3	TAS822*035P1A
0.01	A	0.1	3	TAS103*035P1A
0.012	A	0.1	3	TAS123*035P1A
0.015	A	0.1	3	TAS153*035P1A
0.018	A	0.1	3	TAS183*035P1A
0.022	A	0.1	3	TAS223*035P1A
0.027	A	0.1	3	TAS273*035P1A
0.033	A	0.1	3	TAS333*035P1A
0.039	A	0.1	3	TAS393*035P1A
0.047	A	0.1	3	TAS473*035P1A
0.056	A	0.1	3	TAS563*035P1A
0.068	A	0.1	3	TAS683*035P1A
0.082	A	0.1	3	TAS823*035P1A
0.10	A	0.5	3	TAS104*035P1A
0.12	A	0.5	3	TAS124*035P1A
0.15	A	0.5	3	TAS154*035P1A
0.18	A	0.5	3	TAS184*035P1A
0.22	A	0.5	3	TAS224*035P1A
0.27	A	0.5	3	TAS274*035P1A
0.39	A	0.5	3	TAS394*035P1A
0.47	A	0.5	3	TAS474*035P1A
0.56	A	0.5	3	TAS564*035P1A
0.68	A	0.5	3	TAS684*035P1A
0.82	A	0.5	3	TAS824*035P1A
1.0	A	0.5	3	TAS105*035P1A
1.2	C	0.5	4	TAS125*035P1C
1.5	C	0.5	4	TAS155*035P1C
1.8	C	0.5	4	TAS185*035P1C
2.2	C	1.0	4	TAS225*035P1C
2.7	C	1.0	4	TAS275*035P1C
3.3	C	1.0	4	TAS335*035P1C
3.9	C	1.0	4	TAS395*035P1C
4.7	C	1.0	4	TAS475*035P1C
5.6	C	1.0	4	TAS565*035P1C
6.8	C	1.5	4	TAS685*035P1C
8.2	F	3.0	4	TAS825*035P1F
10	F	3.0	4	TAS106*035P1F
12	F	3.0	4	TAS126*035P1F
15	F	3.0	4	TAS156*035P1F
18	F	3.0	4	TAS186*035P1F
22	F	4.0	4	TAS226*035P1F
27	G	4.5	4	TAS276*035P1G
33	G	5.5	4	TAS336*035P1G
39	G	6.0	4	TAS396*035P1G
47	G	8.0	4	TAS476*035P1G

Cap (µF)	Case Code	Max DCL @ +25°C (µA)	Max D.F. % @+25°C 120 Hz	Catalog Number
50 WVDC @ 85°C 33 WVDC @ 125°C				
0.0047	A	0.1	2	TAS472*050P1A
0.0056	A	0.1	2	TAS562*050P1A
0.0068	A	0.1	2	TAS682*050P1A
0.0082	A	0.1	2	TAS822*050P1A
0.01	A	0.1	2	TAS103*050P1A
0.012	A	0.1	2	TAS123*050P1A
0.015	A	0.1	2	TAS153*050P1A
0.018	A	0.1	2	TAS183*050P1A
0.022	A	0.1	2	TAS223*050P1A
0.027	A	0.1	2	TAS273*050P1A
0.033	A	0.1	2	TAS333*050P1A
0.039	A	0.1	2	TAS393*050P1A
0.047	A	0.1	2	TAS473*050P1A
0.056	A	0.1	2	TAS563*050P1A
0.068	A	0.1	2	TAS683*050P1A
0.082	A	0.1	2	TAS823*050P1A
0.10	A	0.3	2	TAS104*050P1A
0.12	A	0.3	2	TAS124*050P1A
0.15	A	0.3	2	TAS154*050P1A
0.18	A	0.3	2	TAS184*050P1A
0.22	A	0.3	2	TAS224*050P1A
0.27	A	0.3	2	TAS274*050P1A
0.39	A	0.3	2	TAS394*050P1A
0.47	A	0.3	2	TAS474*050P1A
0.56	A	0.3	2	TAS564*050P1A
0.68	A	0.3	2	TAS684*050P1A
0.82	A	0.3	2	TAS824*050P1A
1.0	A	0.4	2	TAS105*050P1A
1.2	C	0.4	4	TAS125*050P1C
1.5	C	0.5	4	TAS155*050P1C
1.8	C	0.5	4	TAS185*050P1C
2.2	C	0.8	4	TAS225*050P1C
2.7	C	0.8	4	TAS275*050P1C
3.3	C	1.2	4	TAS335*050P1C
3.9	C	1.5	4	TAS395*050P1C
4.7	C	1.7	4	TAS475*050P1C
5.6	F	2.2	4	TAS565*050P1F
6.8	F	2.2	4	TAS685*050P1F
8.2	F	2.5	4	TAS825*050P1F
10	F	2.5	4	TAS106*050P1F
12	F	3.0	4	TAS126*050P1F
15	F	4.0	4	TAS156*050P1F
18	F	4.5	4	TAS186*050P1F
22	G	5.5	4	TAS226*050P1G
75 WVDC @ 85°C 50 WVDC @ 125°C				
0.0047	A	0.3	2	TAS472*075P1A
0.0056	A	0.3	2	TAS562*075P1A
0.0068	A	0.3	2	TAS682*075P1A
0.0082	A	0.3	2	TAS822*075P1A
0.01	A	0.3	2	TAS103*075P1A
0.012	A	0.3	2	TAS123*075P1A
0.015	A	0.3	2	TAS153*075P1A
0.018	A	0.3	2	TAS183*075P1A
0.022	A	0.3	2	TAS223*075P1A
0.027	A	0.3	2	TAS273*075P1A
0.033	A	0.3	2	TAS333*075P1A
0.039	A	0.3	2	TAS393*075P1A
0.047	A	0.3	2	TAS473*075P1A
0.056	A	0.3	2	TAS563*075P1A
0.068	A	0.3	2	TAS683*075P1A
0.082	A	0.3	2	TAS823*075P1A
0.10	A	0.3	2	TAS104*075P1A
0.12	A	0.3	2	TAS124*075P1A
0.15	A	0.3	2	TAS154*075P1A
0.18	A	0.3	2	TAS184*075P1A
0.22	A	0.3	2	TAS224*075P1A
0.27	A	0.3	2	TAS274*075P1A
0.33	A	0.3	2	TAS334*075P1A

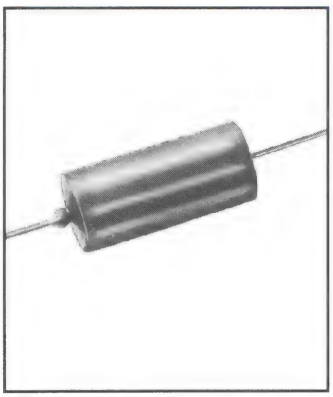
Cap (µF)	Case Code	Max DCL @ +25°C (µA)	Max D.F. % @+25°C 120 Hz	Catalog Number
75 WVDC @ 85°C 50 WVDC @ 125°C				
0.39	A	0.3	2	TAS394*075P1A
0.47	A	0.3	2	TAS474*075P1A
0.56	A	0.3	2	TAS564*075P1A
0.68	A	0.3	2	TAS684*075P1A
0.82	C	0.3	2	TAS824*075P1C
1.0	C	0.3	2	TAS105*075P1C
1.2	C	0.3	4	TAS125*075P1C
1.5	C	0.6	4	TAS155*075P1C
1.8	C	0.7	4	TAS185*075P1C
2.2	C	0.8	4	TAS225*075P1C
2.7	C	1.0	4	TAS275*075P1C
3.3	C	1.2	4	TAS335*075P1C
3.9	C	1.5	4	TAS395*075P1C
4.7	F	3.0	4	TAS475*075P1F
5.6	F	3.0	4	TAS565*075P1F
6.8	F	5.0	4	TAS685*075P1F
8.2	F	5.0	4	TAS825*075P1F
10	F	5.0	4	TAS106*075P1F
12	G	5.0	4	TAS126*075P1G
15	G	7.0	4	TAS156*075P1G
100 WVDC @ 85°C 67 WVDC @ 125°C				
0.0047	A	0.3	2	TAS472*100P1A
0.0056	A	0.3	2	TAS562*100P1A
0.0068	A	0.3	2	TAS682*100P1A
0.0082	A	0.3	2	TAS822*100P1A
0.01	A	0.3	2	TAS103*100P1A
0.012	A	0.3	2	TAS123*100P1A
0.015	A	0.3	2	TAS153*100P1A
0.018	A	0.3	2	TAS183*100P1A
0.022	A	0.3	2	TAS223*100P1A
0.027	A	0.3	2	TAS273*100P1A
0.033	A	0.3	2	TAS333*100P1A
0.039	A	0.3	2	TAS393*100P1A
0.047	A	0.3	2	TAS473*100P1A
0.056	A	0.3	2	TAS563*100P1A
0.068	A	0.3	2	TAS683*100P1A
0.082	A	0.3	2	TAS823*100P1A
0.10	A	0.3	2	TAS104*100P1A
0.12	A	0.3	2	TAS124*100P1A
0.15	A	0.3	2	TAS154*100P1A
0.18	A	0.3	2	TAS184*100P1A
0.22	A	0.3	2	TAS224*100P1A
0.27	A	0.3	2	TAS274*100P1A
0.33	A	0.3	2	TAS334*100P1A
0.39	A	0.3	2	TAS394*100P1A
0.47	A	0.3	2	TAS474*100P1A
0.56	A	0.3	2	TAS564*100P1A
0.68	C	0.3	2	TAS684*100P1C
0.82	C	0.4	2	TAS824*100P1C
1.0	C	0.5	2	TAS105*100P1C
1.2	C	0.5	3	TAS125*100P1C
1.5	C	0.7	3	TAS155*100P1C
1.8	C	0.7	3	TAS185*100P1C
2.2	C	0.9	3	TAS225*100P1C
2.7	C	1.1	3	TAS275*100P1C
3.3	F	1.5	3	TAS335*100P1F
3.9	F	1.5	3	TAS395*100P1F
4.7	F	2.5	3	TAS475*100P1F
5.6	F	2.5	3	TAS565*100P1F
68	F	2.5	3	TAS685*100P1F
8.2	G	5.0	3	TAS825*100P1G
10	G	5.0	3	TAS106*100P1G

* Indicate capacitance tolerance:
J = ±5%
K = ±10%
M = ±20%

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type TXA
Solid Tantalum Capacitors

MALLORY



- Extended Range
- Hermetically Sealed
- Low DC Leakage
- Low Dissipation Factor
- Temperature Stable
- Frequency Stable
- Moisture/Solvent Resistant
- Miniature Size
- Long Shelf Life

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(With proper derating)

Voltage Range:
6 to 50 WVDC @ 85°C

Reverse Voltage (Non-continuous):
15% of rated voltage @ 25°C
5% of rated voltage @ 85°C
1% of rated voltage @ 125°C

Capacitance Range:
1.2 μF to 1000 μF

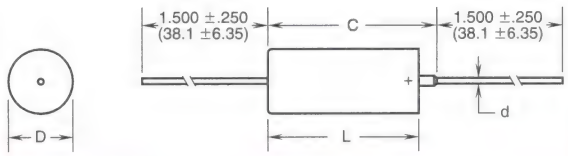
Capacitance Tolerance:
±10%, ±20%
(±5% by special order)

DC Leakage:
At +25°C - See Table Limit
At +85°C - 10 x Table Limit
At +125°C - 12.5 x Table Limit

Maximum Capacitance Change:
-10% @ -55°C
+ 8% @ +85°C
+12% @ +125°C

Maximum Power Dissipation @ 25°C:

Case Code	Watts
A	.09
C	.100
F	.125
G	.180



Case Code	Uninsulated D ±.005 (±.13)	Uninsulated L ±.031 (±.79)	Insulated D ±.010 (±.25)	Insulated L ±.031 (±.79)	C Maximum	d ±.001 (±.03)	Quantity Per Reel
A	.125(3.18)	.250(6.35)	.135(3.43)	.286(7.26)	.422(10.72)	.020(.51)	3,500
C	.175(4.45)	.438(11.13)	.185(4.70)	.474(12.04)	.610(15.49)	.020(.51)	2,500
F	.279(7.09)	.650(16.51)	.289(7.34)	.686(17.42)	.822(20.88)	.025(.64	500
G	.341(8.66)	.750(19.05)	.351(8.92)	.786(19.96)	.922(23.42)	.025(.64)	400

6 WVDC @ 85°C 4 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
8.2	A	0.9	6	TXA825*006P1A
10	A	0.9	6	TXA106*006P1A
12	A	1.0	6	TXA126*006P1A
82	C	3.0	6	TXA826*006P1C
100	C	6.0	6	TXA107*006P1C
220	F	10.0	8	TXA227*006P1F
270	F	10.0	8	TXA277*006P1F
330	F	10.0	8	TXA337*006P1F
390	F	10.0	10	TXA397*006P1F
470	F	10.0	10	TXA477*006P1F
560	G	20.0	10	TXA567*006P1G
680	G	20.0	10	TXA687*006P1G
820	G	20.0	10	TXA827*006P1G
1000	G	20.0	10	TXA108*006P1G

10 WVDC @ 85°C 7 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
5.6	A	1.0	4	TXA565*010P1A
6.8	A	1.0	6	TXA685*010P1A
8.2	A	1.2	6	TXA825*010P1A
47	C	4.0	6	TXA476*010P1C
56	C	5.0	6	TXA566*010P1C
68	C	6.0	6	TXA686*010P1C
82	C	7.0	6	TXA826*010P1C
150	F	8.0	8	TXA157*010P1F
180	F	8.0	8	TXA187*010P1F
220	F	13.0	8	TXA227*010P1F
270	F	13.0	8	TXA277*010P1F
330	G	16.0	8	TXA337*010P1G
390	G	16.0	10	TXA397*010P1G
470	G	16.0	10	TXA477*010P1G
560	G	20.0	10	TXA567*010P1G

15 WVDC @ 85°C 10 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
3.9	A	1.0	4	TXA395*015P1A
4.7	A	1.0	4	TXA475*015P1A
5.6	A	1.3	4	TXA565*015P1A

15 WVDC @ 85°C 10 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
27	C	3.0	6	TXA276*015P1C
33	C	5.0	6	TXA336*015P1C
39	C	5.0	6	TXA396*015P1C
82	F	8.0	6	TXA826*015P1F
100	F	10.0	6	TXA107*015P1F
120	F	10.0	6	TXA127*015P1F
150	F	15.0	8	TXA157*015P1F
180	F	15.0	8	TXA187*015P1F
220	G	20.0	8	TXA227*015P1G
270	G	20.0	8	TXA277*015P1G
330	G	20.0	8	TXA337*015P1G

20 WVDC @ 85°C 13 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
2.7	A	0.8	4	TXA275*020P1A
3.3	A	1.0	4	TXA335*020P1A
3.9	A	1.2	4	TXA395*020P1A
4.7	A	1.2	4	TXA475*020P1A
18	C	3.0	6	TXA186*020P1C
22	C	3.0	6	TXA226*020P1C
27	C	4.0	6	TXA276*020P1C
56	F	7.0	6	TXA566*020P1F
68	F	8.0	6	TXA686*020P1F
82	F	10.0	6	TXA826*020P1F
100	F	12.0	6	TXA107*020P1F
120	F	12.0	6	TXA127*020P1F
150	G	15.0	8	TXA157*020P1G
180	G	15.0	8	TXA187*020P1G

30 WVDC @ 85°C 20 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
1.8	A	1.0	4	TXA185*030P1A
2.2	A	1.0	4	TXA225*030P1A
2.7	A	1.0	4	TXA275*030P1A
12	C	3.0	4	TXA126*030P1C
15	C	3.0	4	TXA156*030P1C
18	C	3.0	4	TXA186*030P1C
33	F	6.0	6	TXA336*030P1F

30 WVDC @ 85°C 20 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
39	F	6.0	6	TXA396*030P1F
47	F	7.0	6	TXA476*030P1F
56	F	7.0	6	TXA566*030P1F
68	F	7.0	6	TXA686*030P1F
100	G	10.0	8	TXA107*030P1G

35 WVDC @ 85°C 23 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
1.5	A	0.8	4	TXA155*035P1A
1.8	A	1.0	4	TXA185*035P1A
8.2	C	3.0	4	TXA825*035P1C
10	C	3.0	4	TXA106*035P1C
27	F	7.0	6	TXA276*035P1F
33	F	8.0	6	TXA336*035P1F
39	F	10.0	6	TXA396*035P1F
47	F	10.0	6	TXA476*035P1F
56	G	12.0	6	TXA566*035P1G
68	G	12.0	6	TXA686*035P1G

50 WVDC @ 85°C 33 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
1.2	A	0.6	4	TXA125*050P1A
1.5	A	0.8	4	TXA155*050P1A
5.6	C	2.5	4	TXA565*050P1C
6.8	C	2.5	4	TXA685*050P1C
22	F	7.0	6	TXA226*050P1F
27	F	8.0	6	TXA276*050P1F
33	G	10.0	6	TXA336*050P1G
39	G	10.0	6	TXA396*050P1G

* Indicate capacitance tolerance:
J = ±5%
K = ±10%
M = ±20%

Type THF
Solid Tantalum Capacitors

MALLORY

- High Ripple Current
- Low ESR
- Lower Impedance at High Frequencies
- Small Size
- Extremely Stable Capacitance
- Hermetically Sealed
- Long Life
- Switching Regulators
- High Frequency Power Supplies
- By-pass Filtering

GENERAL SPECIFICATIONS

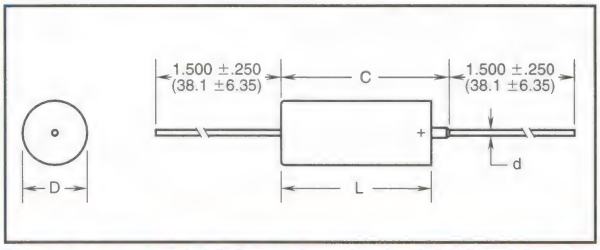
Operating Temperature:
-55°C to +125°C
(With proper derating)

Voltage Range:
6 to 50 WVDC @ 85°C

Capacitance Range:
5.6 μF to 330 μF

Capacitance Tolerance:
Standard ±20%
(±10% by special order)

DC Leakage:
At +25°C - See Table Limit
At +85°C - 10 x Table Limit
At +125°C - 12.5 x Table Limit



Case Code	Uninsulated D ±.005 (±.13)	Uninsulated L ±.031 (±.79)	Insulated D ±.010 (±.25)	Insulated L ±.031 (±.79)	C Maximum	d ±.001 (±.03)	Quantity Per Reel
F	.279(7.09)	.650(16.51)	.289(7.34)	.686(17.42)	.822(20.88)	.025(.64)	500
G	.341(8.66)	.750(19.05)	.351(8.92)	.786(19.96)	.922(23.42)	.025(.64)	400

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 1 kHz	Max ESR (ohms) @100kHz +25°C	Max Ripple RMS Amps @ 40kHz +25°C	Catalog Number
6 WVDC @ 85°C 4 WVDC @ 125°C						
150	F	4.5	10	.065	3.3	THF157*006P1F
180	F	5.5	10	.060	3.4	THF187*006P1F
270	G	6.5	10	.050	4.1	THF277*006P1G
330	G	7.5	12	.045	4.3	THF337*006P1G
10 WVDC @ 85°C 7 WVDC @ 125°C						
82	F	4.0	8	.085	2.9	THF826*010P1F
100	F	5.0	8	.075	3.0	THF107*010P1F
120	F	6.0	8	.070	3.2	THF127*010P1F
180	G	9.0	8	.060	3.7	THF187*010P1G
220	G	10	10	.055	3.9	THF227*010P1G
15 WVDC @ 85°C 10 WVDC @ 125°C						
56	F	4.0	6	.100	2.6	THF566*015P1F
68	F	5.0	6	.095	2.7	THF686*015P1F
120	G	9.0	8	.070	3.5	THF127*015P1G
150	G	10	8	.065	3.6	THF157*015P1G
20 WVDC @ 85°C 13 WVDC @ 125°C						
27	F	2.5	5	.145	2.2	THF276*020P1F
33	F	3.5	5	.130	2.3	THF336*020P1F
39	F	4.0	5	.120	2.4	THF396*020P1F
47	F	4.5	6	.110	2.5	THF476*020P1F
56	G	5.5	6	.100	2.9	THF566*020P1G
68	G	7.0	6	.095	3.0	THF686*020P1G
82	G	8.0	6	.085	3.1	THF826*020P1G
100	G	10	8	.075	3.3	THF107*020P1G

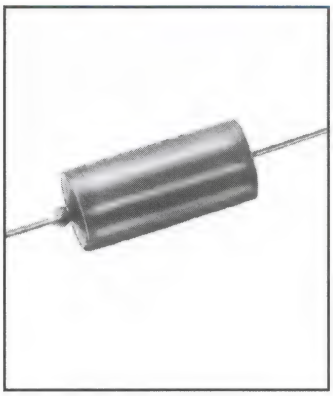
Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 1 kHz	Max ESR (ohms) @100kHz +25°C	Max Ripple RMS Amps @ 40kHz +25°C	Catalog Number
35 WVDC @ 85°C 23 WVDC @ 125°C						
10	F	4.0	4	.161	1.5	THF106*035P1F
22	F	4.0	4	.160	2.1	THF226*035P1F
27	G	4.5	4	.145	2.4	THF276*035P1G
33	G	5.5	5	.130	2.5	THF336*035P1G
39	G	7.0	5	.120	2.6	THF396*035P1G
47	G	8.0	5	.110	2.7	THF476*035P1G
50 WVDC @ 85°C 33 WVDC @ 125°C						
5.6	F	2.2	3	.300	1.5	THF565*050P1F
6.8	F	2.2	3	.275	1.6	THF685*050P1F
8.2	F	2.5	3	.250	1.6	THF825*050P1F
10	F	2.5	3	.230	1.7	THF106*050P1F
12	F	3.0	3	.210	1.8	THF126*050P1F
15	F	4.0	3	.190	1.9	THF156*050P1F
18	F	4.5	4	.175	2.0	THF186*050P1F
22	G	5.5	4	.160	2.3	THF226*050P1G

* Indicate capacitance tolerance:
K = 10%
M = 20%

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

CSR13 (MIL-C-39003/01)
Solid Tantalum Capacitors

MALLORY



- Hermetically Sealed
- Graded Failure Rates
- Low DC Leakage
- Low Dissipation Factor
- Temperature Stable
- Frequency Stable
- Moisture/Solvent Resistant
- Miniature Size
- Long Shelf Life

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(With proper derating)

Voltage Range:
6 to 100 WVDC @ 85°C

Reverse Voltage (non-continuous):
15% of rated voltage @ 25°C
5% of rated voltage @ 85°C
1% of rated voltage @ 125°C

Capacitance Range:
.0047 μF to 330 μF

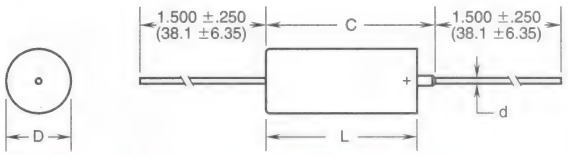
Capacitance Tolerance:
±10%, ±20%
(±5% by special order)

DC Leakage:
At +25°C - See Table Limit
At +85°C - 10 x Table Limit
At +125°C - 12.5 x Table Limit

Capacitance Change Maximum:
-10% @ -55°C
+ 8% @ +85°C
+12%@ +125°C

Maximum Power Dissipation @ 25°C:

Case Code	Watts
A	.09
B	.100
C	.125
D	.180



Case Code	Uninsulated D ±.005 (±.13)	Uninsulated L ±.031 (±.79)	Insulated D ±.010 (±.25)	Insulated L ±.031 (±.79)	C Maximum	d ±.001 (±.03)	Quantity Per Reel
A	.125(3.18)	.250(6.35)	.135(3.43)	.286(7.26)	.422(10.72)	.020(.51)	3,500
B	.175(4.45)	.438(11.13)	.185(4.70)	.474(12.04)	.610(15.49)	.020(.51)	2,500
C	.279(7.09)	.650(16.51)	.289(7.34)	.686(17.42)	.822(20.88)	.025(.64)	500
D	.341(8.66)	.750(19.05)	.351(8.92)	.786(19.96)	.922(23.42)	.025(.64)	400

Cap (μF)	Cap Tolerance (±)	Case Code	Max. DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	MIL-C-39003/1(CSR 13) Dash Numbers: Exponential Failure Rate (% per 1000 hours) 'M' Level (1.0)	'P' Level (.10)	'R' Level (.01)	'S' Level (.001)	Weibull Failure Rate (% per 1000 hours) 'B' Level (.10)	'C' Level (.01)	'D' Level (.001)	MIL Reference Number (Do not order by this number.) See below
6 WVDC @ 85°C — 4 WVDC @ 125°C												
5.6	10	A	0.3	4	2241	2481	2721	2961	6002	7002	8002	CSR13B565K*
6.8	10	A	0.3	6	2242	2482	2722	2962	6004	7004	8004	CSR13B685K*
6.8	20	A	0.3	6	2243	2483	2723	2963	6005	7005	8005	CSR13B685M*
47	10	B	1.5	6	2244	2484	2724	2964	6007	7007	8007	CSR13B476K*
47	20	B	1.5	6	2245	2485	2725	2965	6008	7008	8008	CSR13B476M*
56	10	B	1.5	6	2246	2486	2726	2966	6010	7010	8010	CSR13B566K*
150	10	C	4.5	6	2247	2487	2727	2967	6012	7012	8012	CSR13B157K*
150	20	C	4.5	6	2248	2488	2728	2968	6013	7013	8013	CSR13B157M*
180	10	C	5.5	6	2249	2489	2729	2969	6015	7015	8015	CSR13B187K*
270	10	D	6.0	8	2250	2490	2730	2970	6017	7017	8017	CSR13B277K*
330	10	D	7.5	8	2251	2491	2731	2971	6019	7019	8019	CSR13B337K*
330	20	D	7.5	8	2252	2492	2732	2972	6020	7020	8020	CSR13B337M*
10 WVDC @ 85°C — 7 WVDC @ 125°C												
3.9	10	A	0.3	4	2253	2493	2733	2973	6022	7022	8022	CSR13C395K*
4.7	10	A	0.4	4	2254	2494	2734	2974	6024	7024	8024	CSR13C475K*
4.7	20	A	0.4	4	2255	2495	2735	2975	6025	7025	8025	CSR13C475M*
27	10	B	2.0	6	2256	2496	2736	2976	6027	7027	8027	CSR13C276K*
33	10	B	2.0	6	2257	2497	2737	2977	6029	7029	8029	CSR13C336K*
33	20	B	2.0	6	2258	2498	2738	2978	6030	7030	8030	CSR13C336M*
39	10	B	2.0	6	2259	2499	2739	2979	6032	7032	8032	CSR13C396K*
82	10	C	3.0	6	2260	2500	2740	2980	6034	7034	8034	CSR13C826K*
100	10	C	5.0	6	2261	2501	2741	2981	6036	7036	8036	CSR13C107K*
100	20	C	5.0	6	2262	2502	2742	2982	6037	7037	8037	CSR13C107M*
120	10	C	6.0	6	2263	2503	2743	2983	6039	7039	8039	CSR13C127K*
180	10	D	9.0	6	2264	2504	2744	2984	6041	7041	8041	CSR13C187K*
220	10	D	10.0	8	2265	2505	2745	2985	6043	7043	8043	CSR13C227K*
220	20	D	10.0	8	2266	2506	2746	2986	6044	7044	8044	CSR13C227M*
15 WVDC @ 85°C — 10 WVDC @ 125°C												
2.7	10	A	0.3	4	2267	2507	2747	2987	6046	7046	8046	CSR13D275K*
3.3	10	A	0.4	4	2268	2508	2748	2988	6048	7048	8048	CSR13D335K*
3.3	20	A	0.4	4	2269	2509	2749	2989	6049	7049	8049	CSR13D335M*
18	10	B	2.0	6	2270	2510	2750	2990	6051	7051	8051	CSR13D186K*
22	10	B	2.0	6	2271	2511	2751	2991	6053	7053	8053	CSR13D226K*
22	20	B	2.0	6	2272	2512	2752	2992	6054	7054	8054	CSR13D226M*

TO ORDER: **Indicate the prefix M39003/01 followed by the applicable MIL dash number.**
Example: For M39003/01-2241 or CSR13B565KM; order M39003/012241

* Failure rate level indicator (M, P, R, S)

CSR13 (MIL-C-39003/01)
Solid Tantalum Capacitors

MALLORY

Cap (µF)	Cap Tolerance (±)	Case Code	Max. DCL @ +25°C (µA)	Max D.F. % @+25°C 120 Hz	MIL-C-39003/1(CSR 13) Dash Numbers							MIL Reference Number (Do not order by this number.) See below
					Exponential Failure Rate (% per 1000 hours)				Weibull Failure Rate (% per 1000 hours)			
					'M' Level (1.0)	'P' Level (.10)	'R' Level (.01)	'S' Level (.001)	'B' Level (.10)	'C' Level (.01)	'D' Level (.001)	
15 WVDC @ 85°C — 10 WVDC @ 125°C												
56	10	C	4.0	6	2273	2513	2753	2993	6056	7056	8056	CSR13D566K*
68	10	C	5.0	6	2274	2514	2754	2994	6058	7058	8058	CSR13D686K*
68	20	C	5.0	6	2275	2515	2755	2995	6059	7059	8059	CSR13D686M*
120	10	D	6.0	6	2276	2516	2756	2996	6061	7061	8061	CSR13D127K*
150	10	D	8.0	6	2277	2517	2757	2997	6063	7063	8063	CSR13D157K*
150	20	D	8.0	6	2278	2518	2758	2998	6064	7064	8064	CSR13D157M*
20 WVDC @ 85°C — 13 WVDC @ 125°C												
1.2	10	A	0.3	6	2279	2519	2759	2999	6066	7066	8066	CSR13E125K*
1.5	10	A	0.3	6	2280	2520	2760	3000	6068	7068	8068	CSR13E155K*
1.5	20	A	0.3	6	2281	2521	2761	3001	6069	7069	8069	CSR13E155M*
1.8	10	A	0.3	6	2282	2522	2762	3002	6071	7071	8071	CSR13E185K*
2.2	10	A	0.4	6	2283	2523	2763	3003	6073	7073	8073	CSR13E225K*
2.2	20	A	0.4	6	2284	2524	2764	3004	6074	7074	8074	CSR13E225M*
8.2	10	B	1.0	6	2285	2525	2765	3005	6076	7076	8076	CSR13E825K*
10	10	B	1.0	6	2286	2526	2766	3006	6078	7078	8078	CSR13E106K*
10	20	B	1.0	6	2287	2527	2767	3007	6079	7079	8079	CSR13E106M*
12	10	B	1.0	6	2288	2528	2768	3008	6081	7081	8081	CSR13E126K*
15	10	B	2.0	6	2289	2529	2769	3009	6083	7083	8083	CSR13E156K*
15	20	B	2.0	6	2290	2530	2770	3010	6084	7084	8084	CSR13E156M*
27	10	C	2.5	6	2291	2531	2771	3011	6086	7086	8086	CSR13E276K*
33	10	C	3.0	6	2292	2532	2772	3012	6088	7088	8088	CSR13E336K*
33	20	C	3.0	6	2293	2533	2773	3013	6089	7089	8089	CSR13E336M*
39	10	C	3.0	6	2294	2534	2774	3014	6091	7091	8091	CSR13E396K*
47	10	C	4.5	6	2295	2535	2775	3015	6093	7093	8093	CSR13E476K*
47	20	C	4.5	6	2296	2536	2776	3016	6094	7094	8094	CSR13E476M*
56	10	D	5.5	6	2297	2537	2777	3017	6096	7096	8096	CSR13E566K*
68	10	D	6.0	6	2298	2538	2778	3018	6098	7098	8098	CSR13E686K*
68	20	D	6.0	6	2299	2539	2779	3019	6099	7099	8099	CSR13E686M*
82	10	D	6.0	6	2300	2540	2780	3020	6101	7101	8101	CSR13E826K*
100	10	D	10.0	6	2301	2541	2781	3021	6103	7103	8103	CSR13E107K*
100	20	D	10.0	6	2302	2542	2782	3022	6104	7104	8104	CSR13E107M*
35 WVDC @ 85°C — 23 WVDC @ 125°C												
5.6	10	B	1.0	4	2303	2543	2783	3023	6106	7106	8106	CSR13F565K*
6.8	10	B	1.5	4	2304	2544	2784	3024	6108	7108	8108	CSR13F685K*
6.8	20	B	1.5	4	2305	2545	2785	3025	6109	7109	8109	CSR13F685M*
22	10	C	4.0	4	2306	2546	2786	3026	6111	7111	8111	CSR13F226K*
22	20	C	4.0	4	2307	2547	2787	3027	6112	7112	8112	CSR13F226M*
27	10	D	4.5	4	2308	2548	2788	3028	6114	7114	8114	CSR13F276K*
33	10	D	5.5	4	2309	2549	2789	3029	6116	7116	8116	CSR13F336K*
33	20	D	5.5	4	2310	2550	2790	3030	6117	7117	8117	CSR13F336M*
39	10	D	6.0	4	2311	2551	2791	3031	6119	7119	8119	CSR13F396K*
47	10	D	6.0	4	2312	2552	2792	3032	6121	7121	8121	CSR13F476K*
47	20	D	8.0	4	2313	2553	2793	3033	6122	7122	8122	CSR13F476M*
50 WVDC @ 85°C — 33 WVDC @ 125°C												
0.0047	10	A	0.1	2	2314	2554	2794	3034	6124	7124	8124	CSR13G472K*
0.0047	20	A	0.1	2	2315	2555	2795	3035	6125	7125	8125	CSR13G472M*
0.0056	10	A	0.1	2	2316	2556	2796	3036	6127	7127	8127	CSR13G562K*
0.0068	10	A	0.1	2	2317	2557	2797	3037	6129	7129	8129	CSR13G682K*
0.0068	20	A	0.1	2	2318	2558	2798	3038	6130	7130	8130	CSR13G682M*
0.0082	10	A	0.1	2	2319	2559	2799	3039	6132	7132	8132	CSR13G822K*
0.01	10	A	0.1	2	2320	2560	2800	3040	6134	7134	8134	CSR13G103K*
0.01	20	A	0.1	2	2321	2561	2801	3041	6135	7135	8135	CSR13G103M*
0.012	10	A	0.1	2	2322	2562	2802	3042	6137	7137	8137	CSR13G123K*
0.015	10	A	0.1	2	2323	2563	2803	3043	6139	7139	8139	CSR13G153K*
0.015	20	A	0.1	2	2324	2564	2804	3044	6140	7140	8140	CSR13G153M*
0.018	10	A	0.1	2	2325	2565	2805	3045	6142	7142	8142	CSR13G183K*
0.022	10	A	0.1	2	2326	2566	2806	3046	6144	7144	8144	CSR13G223K*
0.022	20	A	0.1	2	2327	2567	2807	3047	6145	7145	8145	CSR13G223M*
0.027	10	A	0.1	2	2328	2568	2808	3048	6147	7147	8147	CSR13G273K*
0.033	10	A	0.1	2	2329	2569	2809	3049	6149	7149	8149	CSR13G333K*
0.033	20	A	0.1	2	2330	2570	2810	3050	6150	7150	8150	CSR13G333M*
0.039	10	A	0.1	2	2331	2571	2811	3051	6152	7152	8152	CSR13G393K*

TO ORDER: **Indicate the prefix M39003/01 followed by the applicable MIL dash number.**
Example: For M39003/01-2241 or CSR13B565KM; order M39003/012241

* Failure rate level indicator (M, P, R, S)

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

CSR13 (MIL-C-39003/01)
Solid Tantalum Capacitors

MALLORY

Cap (μF)	Cap Tolerance (±)	Case Code	Max. DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	MIL-C-39003/1(CSR 13) Dash Numbers							MIL Reference Number (Do not order by this number.) See below
					Exponential Failure Rate (% per 1000 hours)				Weibull Failure Rate (% per 1000 hours)			
					'M' Level (1.0)	'P' Level (.10)	'R' Level (.01)	'S' Level (.001)	'B' Level (.10)	'C' Level (.01)	'D' Level (.001)	
50 WVDC @ 85°C — 33 WVDC @ 125°C												
0.047	10	A	0.1	2	2332	2572	2812	3052	6154	7154	8154	CSR13G473K*
0.047	20	A	0.1	2	2333	2573	2813	3053	6155	7155	8155	CSR13G473M*
0.056	10	A	0.1	2	2334	2574	2814	3054	6157	7157	8157	CSR13G563K*
0.068	10	A	0.1	2	2335	2575	2815	3055	6159	7159	8159	CSR13G683K*
0.068	20	A	0.1	2	2336	2576	2816	3056	6160	7160	8160	CSR13G683M*
0.082	10	A	0.1	2	2337	2577	2817	3057	6162	7162	8162	CSR13G823K*
0.1	10	A	0.3	2	2338	2578	2818	3058	6164	7164	8164	CSR13G104K*
0.1	20	A	0.3	2	2339	2579	2819	3059	6165	7165	8165	CSR13G104M*
0.12	10	A	0.3	2	2340	2580	2820	3060	6167	7167	8167	CSR13G124K*
0.15	10	A	0.3	2	2341	2581	2821	3061	6169	7169	8169	CSR13G154K*
0.15	20	A	0.3	2	2342	2582	2822	3062	6170	7170	8170	CSR13G154M*
0.18	10	A	0.3	2	2343	2583	2823	3063	6172	7172	8172	CSR13G184K*
0.22	10	A	0.3	2	2344	2584	2824	3064	6174	7174	8174	CSR13G224K*
0.22	20	A	0.3	2	2345	2585	2825	3065	6175	7175	8175	CSR13G224M*
0.27	10	A	0.3	2	2346	2586	2826	3066	6177	7177	8177	CSR13G274K*
0.33	10	A	0.3	2	2347	2587	2827	3067	6179	7179	8179	CSR13G334K*
0.33	20	A	0.3	2	2348	2588	2828	3068	6180	7180	8180	CSR13G334M*
0.39	10	A	0.3	2	2349	2589	2829	3069	6182	7182	8182	CSR13G394K*
0.47	10	A	0.3	2	2350	2590	2830	3070	6184	7184	8184	CSR13G474K*
0.47	20	A	0.3	2	2351	2591	2831	3071	6185	7185	8185	CSR13G474M*
0.56	10	A	0.3	2	2352	2592	2832	3072	6187	7187	8187	CSR13G564K*
0.68	10	A	0.3	2	2353	2593	2833	3073	6189	7189	8189	CSR13G684K*
0.68	20	A	0.3	2	2354	2594	2834	3074	6190	7190	8190	CSR13G684M*
0.82	10	A	0.3	2	2355	2595	2835	3075	6192	7192	8192	CSR13G824K*
1.0	10	A	0.4	2	2356	2596	2836	3076	6194	7194	8194	CSR13G105K*
1.0	20	A	0.4	2	2357	2597	2837	3077	6195	7195	8195	CSR13G105M*
1.2	10	B	0.4	4	2358	2598	2838	3078	6197	7197	8197	CSR13G125K*
1.5	10	B	0.5	4	2359	2599	2839	3079	6199	7199	8199	CSR13G155K*
1.5	20	B	0.5	4	2360	2600	2840	3080	6200	7200	8200	CSR13G155M*
1.8	10	B	0.5	4	2361	2601	2841	3081	6202	7202	8202	CSR13G185K*
2.2	10	B	0.8	4	2362	2602	2842	3082	6204	7204	8204	CSR13G225K*
2.2	20	B	0.8	4	2363	2603	2843	3083	6205	7205	8205	CSR13G225M*
2.7	10	B	0.8	4	2364	2604	2844	3084	6207	7207	8207	CSR13G275K*
3.3	10	B	1.2	4	2365	2605	2845	3085	6209	7209	8209	CSR13G335K*
3.3	20	B	1.2	4	2366	2606	2846	3086	6210	7210	8210	CSR13G335M*
3.9	10	B	1.5	4	2367	2607	2847	3087	6212	7212	8212	CSR13G395K*
4.7	10	B	1.7	4	2368	2608	2848	3088	6214	7214	8214	CSR13G475K*
4.7	20	B	1.7	4	2369	2609	2849	3089	6215	7215	8215	CSR13G475M*
5.6	10	C	2.2	4	2370	2610	2850	3090	6217	7217	8217	CSR13G565K*
6.8	10	C	2.2	4	2371	2611	2851	3091	6219	7219	8219	CSR13G685K*
6.8	20	C	2.2	4	2372	2612	2852	3092	6220	7220	8220	CSR13G685M*
8.2	10	C	2.5	4	2373	2613	2853	3093	6222	7222	8222	CSR13G825K*
10	10	C	2.5	4	2374	2614	2854	3094	6224	7224	8224	CSR13G106K*
10	20	C	2.5	4	2375	2615	2855	3095	6225	7225	8225	CSR13G106M*
12	10	C	0.3	4	2376	2616	2856	3096	6227	7227	8227	CSR13G126K*
15	10	C	4.0	4	2377	2617	2857	3097	6229	7229	8229	CSR13G156K*
15	20	C	4.0	4	2378	2618	2858	3098	6230	7230	8230	CSR13G156M*
18	10	C	4.5	4	2379	2619	2859	3099	6232	7232	8232	CSR13G186K*
22	10	D	5.5	4	2380	2620	2860	3100	6234	7234	8234	CSR13G226K*
22	20	D	5.5	4	2381	2621	2861	3101	6235	7235	8235	CSR13G226M*
75 WVDC @ 85°C — 50 WVDC @ 125°C												
0.1	10	A	0.3	2	2382	2622	2862	3102	6237	7237	8237	CSR13H104K*
0.1	20	A	0.3	2	2383	2623	2863	3103	6238	7238	8238	CSR13H104M*
0.12	10	A	0.3	2	2384	2624	2864	3104	6240	7240	8240	CSR13H124K*
0.15	10	A	0.3	2	2385	2625	2865	3105	6242	7242	8242	CSR13H154K*
0.15	20	A	0.3	2	2386	2626	2866	3106	6243	7243	8243	CSR13H154K*
0.18	10	A	0.3	2	2387	2627	2867	3107	6245	7245	8245	CSR13H184K*
0.22	10	A	0.3	2	2388	2628	2868	3108	6247	7247	8247	CSR13H224K*
0.22	20	A	0.3	2	2389	2629	2869	3109	6248	7248	8248	CSR13H224M*
0.27	10	A	0.3	2	2390	2630	2870	3110	6250	7250	8250	CSR13H274K*
0.33	10	A	0.3	2	2391	2631	2871	3111	6252	7252	8252	CSR13H334K*
0.33	20	A	0.3	2	2392	2632	2872	3112	6253	7253	8253	CSR13H334M*
0.39	10	A	0.3	2	2393	2633	2873	3113	6255	7255	8255	CSR13H394K*
0.47	10	A	0.3	2	2394	2634	2874	3114	6257	7257	8257	CSR13H474K*
0.47	20	A	0.3	2	2395	2635	2875	3115	6258	7258	8258	CSR13H474M*
0.68	20	A	0.3	2	2398	2638	2878	3118	6263	7263	8263	CSR13H684M*

TO ORDER: **Indicate the prefix M39003/01 followed by the applicable MIL dash number.**
Example: For M39003/01-2241 or CSR13B565KM; order M39003/012241

* Failure rate level indicator (M, P, R, S)

CSR13 (MIL-C-39003/01)
Solid Tantalum Capacitors

MALLORY

Cap (µF)	Cap Tolerance (±)	Case Code	Max. DCL @ +25°C (µA)	Max D.F. % @+25°C 120 Hz	MIL-C-39003/1(CSR 13) Dash Numbers							MIL Reference Number (Do not order by this number.) See below
					Exponential Failure Rate (% per 1000 hours)				Weibull Failure Rate (% per 1000 hours)			
					'M' Level (1.0)	'P' Level (.10)	'R' Level (.01)	'S' Level (.001)	'B' Level (.10)	'C' Level (.01)	'D' Level (.001)	
75 WVDC @ 85°C — 50 WVDC @ 125°C												
0.56	10	A	0.3	2	2396	2636	2876	3116	6260	7260	8260	CSR13H564K*
0.68	10	A	0.3	2	2397	2637	2877	3117	6262	7262	8262	CSR13H684K*
0.82	10	B	0.3	2	2399	2639	2879	3119	6265	7265	8265	CSR13H824K*
1.0	10	B	0.3	2	2400	2640	2880	3120	6267	7267	8267	CSR13H105K*
1.0	20	B	0.3	2	2401	2641	2881	3121	6268	7268	8268	CSR13H105M*
1.2	10	B	0.3	4	2402	2642	2882	3122	6270	7270	8270	CSR13H125K*
1.5	10	B	0.6	4	2403	2643	2883	3123	6272	7272	8272	CSR13H155K*
1.5	20	B	0.6	4	2404	2644	2884	3124	6273	7273	8273	CSR13H155M*
1.8	10	B	0.7	4	2405	2645	2885	3125	6275	7275	8275	CSR13H185K*
2.2	10	B	0.8	4	2406	2646	2886	3126	6277	7277	8277	CSR13H225K*
2.2	20	B	0.8	4	2407	2647	2887	3127	6278	7278	8278	CSR13H225M*
2.7	10	B	1.0	4	2408	2648	2888	3128	6280	7280	8280	CSR13H275K*
3.3	10	B	1.2	4	2409	2649	2889	3129	6282	7282	8282	CSR13H335K*
3.3	20	B	1.2	4	2410	2650	2890	3130	6283	7283	8283	CSR13H335M*
3.9	10	B	1.5	4	2411	2651	2891	3131	6285	7285	8285	CSR13H395K*
4.7	10	C	3.0	4	2412	2652	2892	3132	6287	7287	8287	CSR13H475K*
4.7	20	C	3.0	4	2413	2653	2893	3133	6288	7288	8288	CSR13H475M*
5.6	10	C	3.0	4	2414	2654	2894	3134	6290	7290	8290	CSR13H565K*
6.8	10	C	5.0	4	2415	2655	2895	3135	6292	7292	8292	CSR13H685K*
6.8	20	C	5.0	4	2416	2656	2896	3136	6293	7293	8293	CSR13H685M*
8.2	10	C	5.0	4	2417	2657	2897	3137	6295	7295	8295	CSR13H825K*
10	10	C	5.0	4	2418	2658	2898	3138	6297	7297	8297	CSR13H106K*
10	20	C	5.0	4	2419	2659	2899	3139	6298	7298	8298	CSR13H106M*
12	10	D	5.0	4	2420	2660	2900	3140	6300	7300	8300	CSR13H126K*
15	10	D	7.0	4	2421	2661	2901	3141	6302	7302	8302	CSR13H156K*
15	20	D	7.0	4	2422	2662	2902	3142	6303	7303	8303	CSR13H156M*
100 WVDC @ 85°C — 67 WVDC @ 125°C												
0.0047	10	A	0.3	2	2423	2663	2903	3143	6305	7305	+8305	CSR13J472K*
0.0047	20	A	0.3	2	2424	2664	2904	3144	6306	7306	+8306	CSR13J472M*
0.0056	10	A	0.3	2	2425	2665	2905	3145	6308	7308	+8308	CSR13J562K*
0.0068	10	A	0.3	2	2426	2666	2906	3146	6310	7310	+8310	CSR13J682K*
0.0068	20	A	0.3	2	2427	2667	2907	3147	6311	7311	+8311	CSR13J682M*
0.0082	10	A	0.3	2	2428	2668	2908	3148	6313	7313	+8313	CSR13J822K*
0.01	10	A	0.3	2	2429	2669	2909	3149	6315	7315	+8315	CSR13J103K*
0.01	20	A	0.3	2	2430	2670	2910	3150	6316	7316	+8316	CSR13J103M*
0.012	10	A	0.3	2	2431	2671	2911	3151	6318	7318	+8318	CSR13J123K*
0.015	10	A	0.3	2	2432	2672	2912	3152	6320	7320	+8320	CSR13J153K*
0.015	20	A	0.3	2	2433	2673	2913	3153	6321	7321	+8321	CSR13J153M*
0.018	10	A	0.3	2	2434	2674	2914	3154	6323	7323	+8323	CSR13J183K*
0.022	10	A	0.3	2	2435	2675	2915	3155	6325	7325	+8325	CSR13J223K*
0.022	20	A	0.3	2	2436	2676	2916	3156	6326	7326	+8326	CSR13J223M*
0.027	10	A	0.3	2	2437	2677	2917	3157	6328	7328	+8328	CSR13J273K*
0.033	10	A	0.3	2	2438	2678	2918	3158	6330	7330	+8330	CSR13J333K*
0.033	20	A	0.3	2	2439	2679	2919	3159	6331	7331	+8331	CSR13J333M*
0.039	10	A	0.3	2	2440	2680	2920	3160	6333	7333	+8333	CSR13J393K*
0.047	10	A	0.3	2	2441	2681	2921	3161	6335	7335	+8335	CSR13J473K*
0.047	20	A	0.3	2	2442	2682	2922	3162	6336	7336	+8336	CSR13J473M*
0.056	10	A	0.3	2	2443	2683	2923	3163	6338	7338	+8338	CSR13J563K*
0.068	10	A	0.3	2	2444	2684	2924	3164	6340	7340	+8340	CSR13J683K*
0.068	20	A	0.3	2	2445	2685	2925	3165	6341	7341	+8341	CSR13J683M*
0.082	10	A	0.3	2	2446	2686	2926	3166	6343	7343	+8343	CSR13J823K*
0.1	10	A	0.3	2	2447	2687	2927	3167	6345	7345	+8345	CSR13J104K*
0.1	20	A	0.3	2	2448	2688	2928	3168	6346	7346	+8346	CSR13J104M*
0.12	10	A	0.3	2	2449	2689	2929	3169	6348	7348	+8348	CSR13J124K*
0.15	10	A	0.3	2	2450	2690	2930	3170	6350	7350	+8350	CSR13J154K*
0.15	20	A	0.3	2	2451	2691	2931	3171	6351	7351	+8351	CSR13J154M*
0.18	10	A	0.3	2	2452	2692	2932	3172	6353	7353	+8353	CSR13J184K*
0.22	10	A	0.3	2	2453	2693	2933	3173	6355	7355	+8355	CSR13J224K*
0.22	20	A	0.3	2	2454	2694	2934	3174	6356	7356	+8356	CSR13J224M*
0.27	10	A	0.3	2	2455	2695	2935	3175	6358	7358	+8358	CSR13J274K*
0.33	10	A	0.3	2	2456	2696	2936	3176	6360	7360	+8360	CSR13J334K*
0.33	20	A	0.3	2	2457	2697	2937	3177	6361	7361	+8361	CSR13J334M*

+ D failure rate: Not QPL for -8305 thru -8401

TO ORDER: **Indicate the prefix M39003/01 followed by the applicable MIL dash number.**
Example: For M39003/01-2241 or CSR13B565KM; order M39003/012241

* Failure rate level indicator (M, P, R, S)

CSR13 (MIL-C-39003/01) Solid Tantalum Capacitors

MALLORY

Cap (μF)	Cap Tolerance (±)	Case Code	Max. DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	MIL-C-39003/1(CSR 13) Dash Numbers							MIL Reference Number (Do not order by this number.) See below
					Exponential Failure Rate (% per 1000 hours)				Weibull Failure Rate (% per 1000 hours)			
					'M' Level (1.0)	'P' Level (.10)	'R' Level (.01)	'S' Level (.001)	'B' Level (.10)	'C' Level (.01)	'D' Level (.001)	
100 WVDC @ 85°C — 67 WVDC @ 125°C												
0.39	10	A	0.3	2	2458	2698	2938	3178	6363	7363	+8363	CSR13J394K*
0.47	10	A	0.3	2	2459	2699	2939	3179	6365	7365	+8365	CSR13J474K*
0.47	20	A	0.3	2	2460	2700	2940	3180	6366	7366	+8366	CSR13J474M*
0.56	10	A	0.3	2	2461	2701	2941	3181	6368	7368	+8368	CSR13J564K*
0.68	10	B	0.3	2	2462	2702	2942	3182	6370	7370	+8370	CSR13J684K*
0.68	20	B	0.3	2	2463	2703	2943	3183	6371	7371	+8371	CSR13J684M*
0.82	10	B	0.4	2	2464	2704	2944	3184	6373	7373	+8373	CSR13J824K*
1.0	10	B	0.5	2	2465	2705	2945	3185	6375	7375	+8375	CSR13J105K*
1.0	20	B	0.5	2	2466	2706	2946	3186	6376	7376	+8376	CSR13J105M*
1.2	10	B	0.5	3	2467	2707	2947	3187	6378	7378	+8378	CSR13J125K*
1.5	10	B	0.7	3	2468	2708	2948	3188	6380	7380	+8380	CSR13J155K*
1.5	20	B	0.7	3	2469	2709	2949	3189	6381	7381	+8381	CSR13J155M*
1.8	10	B	0.7	3	2470	2710	2950	3190	6383	7383	+8383	CSR13J185K*
2.2	10	B	0.9	3	2471	2711	2951	3191	6385	7385	+8385	CSR13J225K*
2.2	20	B	0.9	3	2472	2712	2952	3192	6386	7386	+8386	CSR13J225M*
2.7	10	B	1.1	3	2473	2713	2953	3193	6388	7388	+8388	CSR13J275K*
3.3	10	C	1.5	3	5157	5357	5557	5757	6390	+7390	+8390	CSR13J335K*
3.3	20	C	1.5	3	5158	5358	5558	5758	6391	+7391	+8391	CSR13J335M*
3.9	10	C	1.5	3	5160	5360	5560	5760	6393	+7393	+8393	CSR13J395K*
4.7	10	C	2.5	3	5162	5362	5562	5762	6395	+7395	+8395	CSR13J475K*
4.7	20	C	2.5	3	5163	5363	5563	5763	6396	+7396	+8396	CSR13J475M*
5.6	10	C	2.5	3	5165	5365	5565	5765	6398	+7398	+8398	CSR13J565K*
6.8	10	C	2.5	3	5167	5367	5567	5767	6400	+7400	+8400	CSR13J685K*
6.8	20	C	2.5	3	5168	5368	5568	5768	6401	+7401	+8401	CSR13J685M*

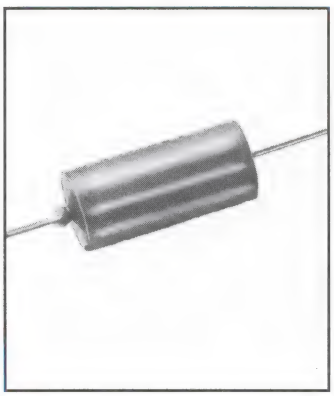
+ C failure rate: Not QPL for -7390 thru -7401
+ D failure rate: Not QPL for -8305 thru -8401

TO ORDER: Indicate the prefix M39003/01 followed by the applicable MIL dash number.
Example: For M39003/01-2241 or CSR13B565KM; order M39003/012241

* Failure rate level indicator (M, P, R, S)

CSR21 (MIL-C-39003/09)
Solid Tantalum Capacitors

MALLORY



- High Frequency Operation
- High Ripple Capability
- Very Low ESR/Impedance
- Hermetically Sealed
- Graded Failure Rates
- Low DC Leakage
- Temperature Stable
- Frequency Stable
- Moisture/Solvent Resistant
- Miniature Size
- Long Shelf Life

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(With proper derating)

Voltage Range:
6 to 50 WVDC @ 85°C

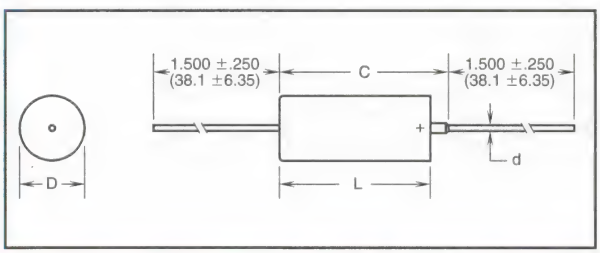
Reverse Voltage (Non-continuous):
15% of rated voltage @ 25°C
5% of rated voltage @ 85°C
1% of rated voltage @ 125°C

Capacitance Range:
5.6 μF to 330 μF

Capacitance Tolerance:
±10%, ±20%

Capacitance Change Maximum:
-10% @ -55°C
+ 8% @ +85°C
+12% @ +125°C

DC Leakage:
At +25°C - See Table Limit
At +85°C - 10 x Table Limit
At +125°C - 12.5 x Table Limit



Case Code	Uninsulated D ±.005 (±.13)	Uninsulated L ±.031 (±.79)	Insulated D ±.010 (±.25)	Insulated L ±.031 (±.79)	C Maximum	d ±.001 (±.03)	Quantity Per Reel
C	.279(7.09)	.650(16.51)	.289(7.34)	.686(17.42)	.822(20.88)	.025(.64)	500
D	.341(8.66)	.750(19.05)	.351(8.92)	.786(19.96)	.922(23.42)	.025(.64)	400

Cap (μF)	Cap Tolerance (±)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 1kHz	Max ESR (ohms) @100kHz +25°C	Max Ripple RMS Amps @ 40kHz +25°C	MIL-C-39003/9(CSR 21) Dash Numbers: Exponential Failure Rate (% per 1000 hours) 'M' Level (1.0)	'P' Level (.10)	'R' Level (.01)	'S' Level (.001)	Weibull Failure Rate (% per 1000 hours) 'B' Level (.10)	'C' Level (.01)	'D' Level (.001)
6 WVDC @ 85°C — 4 WVDC @ 125°C													
150	10	C	4.5	10	.065	3.3	0002	0102	0202	0302	2002	3002	4002
150	20	C	4.5	10	.065	3.3	0003	0103	0203	0303	2003	3003	4003
180	10	C	5.5	10	.060	3.4	0005	0105	0205	0305	2005	3005	4005
270	10	D	6.5	10	.050	4.1	0007	0107	0207	0307	2007	3007	4007
330	10	D	7.5	12	.045	4.3	0009	0109	0209	0309	2009	3009	4009
330	20	D	7.5	12	.045	4.3	0010	0110	0210	0310	2010	3010	4010
10 WVDC @ 85°C — 7 WVDC @ 125°C													
82	10	C	4.0	8	.085	2.9	0012	0112	0212	0312	2012	3012	4012
100	10	C	5.0	8	.075	3.0	0014	0114	0214	0314	2014	3014	4014
100	20	C	5.0	8	.075	3.0	0015	0115	0215	0315	2015	3015	4015
120	10	C	6.0	8	.070	3.2	0017	0117	0217	0317	2017	3017	4017
180	10	D	9.0	8	.060	3.7	0019	0119	0219	0319	2019	3019	4019
220	10	D	10.0	10	.055	3.9	0021	0121	0221	0321	2021	3021	4021
220	20	D	10.0	10	.055	3.9	0022	0122	0222	0322	2022	3022	4022
15 WVDC @ 85°C — 13 WVDC @ 125°C													
56	10	C	4.0	6	.100	2.6	0024	0124	0224	0324	2024	3024	4024
68	10	C	5.0	6	.095	2.7	0026	0126	0226	0326	2026	3026	4026
68	20	C	5.0	6	.095	2.7	0027	0127	0227	0327	2027	3027	4027
120	10	D	9.0	8	.070	3.5	0029	0129	0229	0329	2029	3029	4029
150	10	D	10.0	8	.065	3.6	0031	0131	0231	0331	2031	3031	4031
150	20	D	10.0	8	.065	3.6	0032	0132	0232	0332	2032	3032	4032
20 WVDC @ 85°C — 13 WVDC @ 125°C													
27	10	C	2.5	5	.145	2.2	0034	0134	0234	0334	2034	3034	4034
33	10	C	3.5	5	.130	2.3	0036	0136	0236	0336	2036	3036	4036
33	20	C	3.5	5	.130	2.3	0037	0137	0237	0337	2037	3037	4037
39	10	C	4.0	5	.120	2.4	0039	0139	0239	0339	2039	3039	4039
47	10	C	4.5	6	.110	2.5	0041	0141	0241	0341	2041	3041	4041
47	20	C	4.5	6	.110	2.5	0042	0142	0242	0342	2042	3042	4042
56	10	D	5.5	6	.100	2.9	0044	0144	0244	0344	2044	3044	4044
68	10	D	7.0	6	.095	3.0	0046	0146	0246	0346	2046	3046	4046
68	20	D	7.0	6	.095	3.0	0047	0147	0247	0347	2047	3047	4047

TO ORDER: **Indicate the prefix M39003/09 followed by the applicable MIL dash number.**
Example: For M39003/09-0002; order M39003/090002

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

CSR21 (MIL-C-39003/09)
Solid Tantalum Capacitors

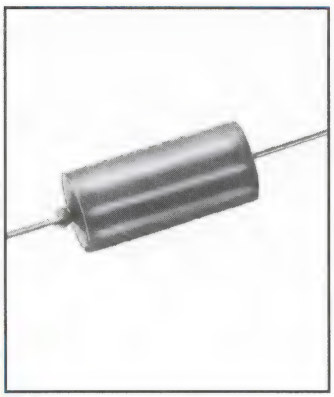
MALLORY

Cap (μF)	Cap Tolerance (±)	Case Code	Max. DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	MIL-C-39003/1(CSR 21) Dash Numbers							MIL Reference Number (Do not order by this number.) See below
					Exponential Failure Rate (% per 1000 hours)				Weibull Failure Rate (% per 1000 hours)			
					'M' Level (1.0)	'P' Level (.10)	'R' Level (.01)	'S' Level (.001)	'B' Level (.10)	'C' Level (.01)	'D' Level (.001)	
20 WVDC @ 85°C — 13 WVDC @ 125°C												
82	10	D	8.0	6	.085	3.1	0049	0149	0249	0349	2049	3049	4049
100	10	D	10.0	8	.075	3.3	0051	0151	0251	0351	2051	3051	4051
100	20	D	10.0	8	.075	3.3	0052	0152	0252	0352	2052	3052	4052
35 WVDC @ 85°C — 23 WVDC @ 125°C												
22	10	C	4.0	4	.160	2.1	0054	0154	0254	0354	2054	3054	4054
22	20	C	4.0	4	.160	2.1	0055	0155	0255	0355	2055	3055	4055
27	10	D	4.5	4	.145	2.4	0057	0157	0257	0357	2057	3057	4057
33	10	D	5.5	5	.130	2.5	0059	0159	0259	0359	2059	3059	4059
33	20	D	5.5	5	.130	2.5	0060	0160	0260	0360	2060	3060	4060
39	10	D	7.0	5	.120	2.6	0062	0162	0262	0362	2062	3062	4062
47	10	D	8.0	5	.110	2.7	0064	0164	0264	0364	2064	3064	4064
47	20	D	8.0	5	.110	2.7	0065	0165	0265	0365	2065	3065	4065
50 WVDC @ 85°C — 33 WVDC @ 125°C												
5.6	10	C	2.2	3	.300	1.5	0067	0167	0267	0367	2067	3067	4067
6.8	10	C	2.2	3	.275	1.6	0069	0169	0269	0369	2069	3069	4069
6.8	20	C	2.2	3	.250	1.6	0070	0170	0270	0370	2070	3070	4070
8.2	10	C	2.5	3	.250	1.6	0072	0172	0272	0372	2072	3072	4072
10	10	C	2.5	3	.230	1.7	0074	0174	0274	0374	2074	3074	4074
10	20	C	2.5	3	.230	1.7	0075	0175	0275	0375	2075	3075	4075
12	10	C	3.0	3	.210	1.8	0077	0177	0277	0377	2077	3077	4077
15	10	C	4.0	3	.190	1.9	0079	0179	0279	0379	2079	3079	4079
15	20	C	4.0	3	.190	1.9	0080	0180	0280	0380	2080	3080	4080
18	10	C	4.5	4	.175	2.0	0082	0182	0282	0382	2082	3082	4082
22	10	D	5.5	4	.160	2.3	0084	0184	0284	0384	2084	3084	4084
22	20	D	5.5	4	.160	2.3	0085	0185	0285	0385	2085	3085	4085

TO ORDER: **Indicate the prefix M39003/09 followed by the applicable MIL dash number.**
Example: For M39003/09-0002; order M39003/090002

CSR23 (MIL-C-39003/03)
Solid Tantalum Capacitors

MALLORY



- Extended Capacitance
- Graded Failure Rates
- Hermetically Sealed
- Low DC Leakage
- Low Dissipation Factor
- Temperature Stable
- Frequency Stable
- Moisture/Solvent Resistant
- Miniature Size
- Long Shelf Life

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(With proper derating)

Voltage Range:
6 to 50 WVDC @ 85°C

Reverse Voltage (Non-continuous):
15% of rated voltage @ 25°C
5% of rated voltage @ 85°C
1% of rated voltage @ 125°C

Capacitance Range:
1.2 μF to 1000 μF

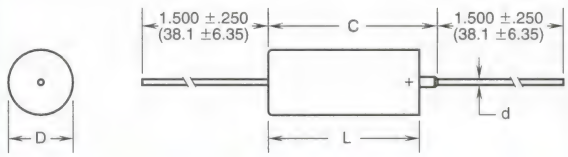
Capacitance Tolerance:
±10%, ±20%
(±5% by special order)

DC Leakage:
At +25°C - See Table Limit
At +85°C - 10 x Table Limit
At +125°C - 12.5 x Table Limit

Capacitance Change Maximum:
-10% @ -55°C
+ 8% @ +85°C
+12% @ +125°C

Maximum Power Dissipation @ 25°C:

Case Code	Watts
A	.09
B	.100
C	.125
D	.180



Case Code	Uninsulated D ±.005 (±.13)	Uninsulated L ±.031 (±.79)	Insulated D ±.010 (±.25)	Insulated L ±.031 (±.79)	C Maximum	d ±.001 (±.03)	Quantity Per Reel
A	.125(3.18)	.250(6.35)	.135(3.43)	.286(7.26)	.422(10.72)	.020(.51)	3,500
B	.175(4.45)	.438(11.13)	.185(4.70)	.474(12.04)	.610(15.49)	.020(.51)	2,500
C	.279(7.09)	.650(16.51)	.289(7.34)	.686(17.42)	.822(20.88)	.025(.64)	500
D	.341(8.66)	.750(19.05)	.351(8.92)	.786(19.96)	.922(23.42)	.025(.64)	400

Cap (μF)	Cap Tolerance (±)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	MIL-C-39003/3(CSR 23) Dash Numbers: Exponential Failure Rate (% per 1000 hours) 'M' Level (1.0)	'P' Level (.10)	'R' Level (.01)	'S' Level (.001)	Weibull Failure Rate (% per 1000 hours) 'B' Level (.10)	'C' Level (.01)	'D' Level (.001)
6 WVDC @ 85°C — 4 WVDC @ 125°C											
10	10	A	0.9	6	0101	0201	0301	0401	2001	3001	4001
10	20	A	0.9	6	0102	0202	0302	0402	2002	3002	4002
12	10	A	1.0	6	0103	0203	0303	0403	2003	3003	4003
100	10	B	6.0	8	0104	0204	0304	0404	2004	3004	4004
100	20	B	6.0	8	0105	0205	0305	0405	2005	3005	4005
330	10	C	15.0	8	0106	0206	0306	0406	2006	3006	4006
330	20	C	15.0	8	0107	0207	0307	0407	2007	3007	4007
390	10	C	15.0	10	0108	0208	0308	0408	2008	3008	4008
470	10	C	15.0	10	0109	0209	0309	0409	2009	3009	4009
470	20	C	15.0	10	0110	0210	0310	0410	2010	3010	4010
680	10	D	20.0	10	0111	0211	0311	0411	2011	3011	4011
680	20	D	20.0	10	0112	0212	0312	0412	2012	3012	4012
820	10	D	20.0	10	0113	0213	0313	0413	2013	3013	4013
1000	10	D	30.0	10	0114	0214	0314	0414	2014	3014	4014
1000	20	D	30.0	10	0115	0215	0315	0415	2015	3015	4015
10 WVDC @ 85°C — 7 WVDC @ 125°C											
6.8	10	A	1.0	6	0116	0216	0316	0416	2016	3016	4016
6.8	20	A	1.0	6	0117	0217	0317	0417	2017	3017	4017
8.2	10	A	1.2	6	0118	0218	0318	0418	2018	3018	4018
47	10	B	5.0	6	0119	0219	0319	0419	2019	3019	4019
47	20	B	5.0	6	0120	0220	0320	0420	2020	3020	4020
56	10	B	6.0	6	0121	0221	0321	0421	2021	3021	4021
68	10	B	7.0	6	0122	0222	0322	0422	2022	3022	4022
68	20	B	7.0	6	0123	0223	0323	0423	2023	3023	4023
82	10	B	8.0	6	0124	0224	0324	0424	2024	3024	4024
220	10	C	15.0	6	0125	0225	0325	0425	2025	3025	4025
220	20	C	15.0	6	0126	0226	0326	0426	2026	3026	4026
270	10	C	15.0	8	0127	0227	0327	0427	2027	3027	4027
390	10	D	20.0	10	0128	0228	0328	0428	2028	3028	4028
470	10	D	20.0	10	0129	0229	0329	0429	2029	3029	4029
470	20	D	20.0	10	0130	0230	0330	0430	2030	3030	4030
560	10	D	30.0	10	0131	0231	0331	0431	2031	3031	4031

TO ORDER: **Indicate the prefix M39003/03 followed by the applicable MIL dash number.**
Example: For M39003/03-0182; order M39003/030182

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

CSR23 (MIL-C-39003/03)
Solid Tantalum Capacitors

MALLORY

Cap (µF)	Cap Tolerance (±)	Case Code	Max DCL @ +25°C (µA)	Max D.F. % @+25°C 120 Hz	MIL-C-39003/3(CSR 23) Dash Numbers						
					Exponential Failure Rate (% per 1000 hours)				Weibull Failure Rate (% per 1000 hours)		
					'M' Level (1.0)	'P' Level (.10)	'R' Level (.01)	'S' Level (.001)	'B' Level (.10)	'C' Level (.01)	'D' Level (.001)
15 WVDC @ 85°C — 10 WVDC @ 125°C											
4.7	10	A	1.0	4	0132	0232	0332	0432	2032	3032	4032
4.7	20	A	1.0	4	0133	0233	0333	0433	2033	3033	4033
5.6	10	A	1.3	4	0134	0234	0334	0434	2034	3034	4034
33	10	B	6.0	6	0135	0235	0335	0435	2035	3035	4035
33	20	B	6.0	6	0136	0236	0336	0436	2036	3036	4036
39	10	B	15.0	6	0137	0237	0337	0437	2037	3037	4037
150	10	C	15.0	8	0138	0238	0338	0438	2038	3038	4038
150	20	C	15.0	8	0139	0239	0339	0439	2039	3039	4039
180	10	C	20.0	8	0140	0240	0340	0440	2040	3040	4040
220	10	D	20.0	8	0141	0241	0341	0441	2041	3041	4041
220	20	D	20.0	8	0142	0242	0342	0442	2042	3042	4042
270	10	D	20.0	8	0143	0243	0343	0443	2043	3043	4043
330	10	D	20.0	8	0144	0244	0344	0444	2044	3044	4044
330	20	D	20.0	8	0145	0245	0345	0445	2045	3045	4045
20 WVDC @ 85°C — 13 WVDC @ 125°C											
2.7	10	A	0.8	4	0146	0246	0346	0446	2046	3046	4046
3.3	10	A	1.0	4	0147	0247	0347	0447	2047	3047	4047
3.3	20	A	1.0	4	0148	0248	0348	0448	2048	3048	4048
3.9	10	A	1.2	4	0149	0249	0349	0449	2049	3049	4049
18	10	B	4.0	6	0150	0250	0350	0450	2050	3050	4050
22	10	B	4.0	6	0151	0251	0351	0451	2051	3051	4051
22	20	B	4.0	6	0152	0252	0352	0452	2052	3052	4052
27	10	B	5.0	6	0153	0253	0353	0453	2053	3053	4053
56	10	C	9.0	6	0154	0254	0354	0454	2054	3054	4054
68	10	C	10.0	6	0155	0255	0355	0455	2055	3055	4055
68	20	C	10.0	6	0156	0256	0356	0456	2056	3056	4056
82	10	C	10.0	6	0157	0257	0357	0457	2057	3057	4057
100	10	C	15.0	6	0158	0258	0358	0458	2058	3058	4058
100	20	C	15.0	6	0159	0259	0359	0459	2059	3059	4059
120	10	C	15.0	6	0160	0260	0360	0460	2060	3060	4060
150	10	D	20.0	8	0161	0261	0361	0461	2061	3061	4061
150	20	D	20.0	8	0162	0262	0362	0462	2062	3062	4062
180	10	D	20.0	8	0163	0263	0363	0463	2063	3063	4063
35 WVDC @ 85°C — 23 WVDC @ 125°C											
1.8	10	A	1.0	4	0164	0264	0364	0464	2064	3064	4064
8.2	10	B	3.5	6	0165	0265	0365	0465	2065	3065	4065
10	10	B	4.0	6	0166	0266	0366	0466	2066	3066	4066
10	20	B	4.0	6	0167	0267	0367	0467	2067	3067	4067
33	10	C	10.0	6	0168	0268	0368	0468	2068	3068	4068
33	20	C	10.0	6	0169	0269	0369	0469	2069	3069	4069
39	10	C	10.0	6	0170	0270	0370	0470	2070	3070	4070
47	10	C	10.0	6	0171	0271	0371	0471	2071	3071	4071
47	20	C	10.0	6	0172	0272	0372	0472	2072	3072	4072
56	10	D	15.0	6	0173	0273	0373	0473	2073	3073	4073
68	10	D	15.0	6	0174	0274	0374	0474	2074	3074	4074
68	20	D	15.0	6	0175	0275	0375	0475	2075	3075	4075
50 WVDC @ 85°C — 33 WVDC @ 125°C											
1.2	10	A	0.9	4	0176	0276	0376	0476	2076	3076	4076
1.5	10	A	1.2	4	0177	0277	0377	0477	2077	3077	4077
1.5	20	A	1.2	4	0178	0278	0378	0478	2078	3078	4078
5.6	10	B	4.5	4	0179	0279	0379	0479	2079	3079	4079
6.8	10	B	4.5	6	0180	0280	0380	0480	2080	3080	4080
6.8	20	B	4.5	6	0181	0281	0381	0481	2081	3081	4081
22	10	C	10.0	6	0182	0282	0382	0482	2082	3082	4082
22	20	C	10.0	6	0183	0283	0383	0483	2083	3083	4083
27	10	C	10.0	6	0184	0284	0384	0484	2084	3084	4084
33	10	D	10.0	6	0185	0285	0385	0485	2085	+ 3085	+ 4085
33	20	D	10.0	6	0186	0286	0386	0486	2086	+ 3086	+ 4086
39	10	D	10.0	6	0187	0287	0387	0487	2087	+ 3087	+ 4087

TO ORDER: **Indicate the prefix M39003/03 followed by the applicable MIL dash number.**
Example: For M39003/03-0182; order M39003/030182

+ C failure rate: Not QPL for -3085 thru -3087
+ D failure rate: Not QPL for -4085 thru -4087

Type TAC
Solid Tantalum Capacitors

MALLORY

- Precision Molded
- Flame Retardant
- Resistant to Shock & Vibration
- Tapered for Polarity Identification
- Taped and Reeled
- Highest CV per Case Size
- Long Shelf Life
- Miniature Sizes

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(With proper derating)

Voltage Range:
6 to 50 WVDC @ 85°C

Reverse Voltage (Non-continuous):
15% of rated voltage @ 25°C
5% of rated voltage @ 85°C
1% of rated voltage @ 125°C

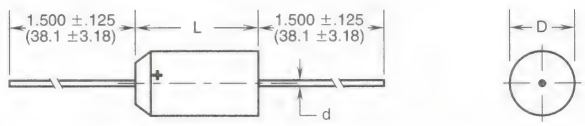
Capacitance Range:
.10 μF to 330 μF

Capacitance Tolerance:
±10% (±5% by special order)

Capacitance Change Maximum:
-10% @ -55°C
+10% @ +85°C
+12% @ +125°C

Reel Packaged per EIA-RS 296

Case Code	Quantity
1	4500 per 12" Reel
2	4000 per 12" Reel
5 & 6	2500 per 12" Reel
7 & 8	500 per 12" Reel



Dimensions - Inches (Millimeters)

Case Code	D (Max)	L (Max)	d
1	.095 (2.41)	.260 (6.6)	.020 (.51)
2	.110 (2.79)	.290 (7.37)	.020 (.51)
5	.180 (4.57)	.345 (8.76)	.020 (.51)
6	.180 (4.57)	.420 (10.67)	.020 (.51)
7	.280 (7.11)	.530 (13.46)	.025 (.64)
8	.300 (7.62)	.710 (18.03)	.025 (.64)

6 WVDC @ 85°C / 4 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @ +25°C 120 Hz	Catalog Number
3.3	1	0.5	4	TAC335K006P01
3.9	1	0.5	4	TAC395K006P01
4.7	1	0.5	4	TAC475K006P01
5.6	2	0.5	4	TAC565K006P02
6.8	2	0.5	6	TAC685K006P02
8.2	2	0.5	6	TAC825K006P02
10	2	0.5	6	TAC106K006P02
12	2	0.6	6	TAC126K006P02
15	2	0.7	6	TAC156K006P02
18	5	0.9	6	TAC186K006P05
22	5	1.1	6	TAC226K006P05
27	5	1.3	6	TAC276K006P05
33	5	1.5	6	TAC336K006P05
39	6	1.9	6	TAC396K006P06
47	6	2.3	6	TAC476K006P06
56	6	2.7	6	TAC566K006P06
68	6	3.3	6	TAC686K006P06
82	7	3.9	8	TAC826K006P07
100	7	4.8	8	TAC107K006P07
120	7	5.0	8	TAC127K006P07
150	7	5.0	8	TAC157K006P07
180	7	8.6	8	TAC187K006P07
220	7	10	8	TAC227K006P07
270	8	10	8	TAC277K006P08
330	8	10	8	TAC337K006P08

10 WVDC @ 85°C / 7 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @ +25°C 120 Hz	Catalog Number
2.2	1	0.5	4	TAC225K010P01
2.7	1	0.5	4	TAC275K010P01
3.3	1	0.5	4	TAC335K010P01
3.9	2	0.5	4	TAC395K010P02
4.7	2	0.5	4	TAC475K010P02
5.6	2	0.5	4	TAC565K010P02
6.8	2	0.5	6	TAC685K010P02
8.2	2	0.7	6	TAC825K010P02
10	2	0.8	6	TAC106K010P02
12	5	1.0	6	TAC126K010P05
15	5	1.2	6	TAC156K010P05
18	5	1.4	6	TAC186K010P05
22	5	1.5	6	TAC226K010P05
27	6	2.2	6	TAC276K010P06
33	6	2.6	6	TAC336K010P06
39	6	3.1	6	TAC396K010P06
47	6	3.8	6	TAC476K010P06
56	7	4.4	6	TAC566K010P07
68	7	5.0	6	TAC686K010P07
82	7	5.0	8	TAC826K010P07
100	7	8.0	8	TAC107K010P07
120	7	9.6	8	TAC127K010P07
150	7	10.0	8	TAC157K010P07
180	8	10.0	8	TAC187K010P08
220	8	10.0	8	TAC227K010P08

15 WVDC @ 85°C / 10 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @ +25°C 120 Hz	Catalog Number
1.5	1	0.5	4	TAC155K015P01
1.8	1	0.5	4	TAC185K015P01
2.2	1	0.5	4	TAC225K015P01
2.7	2	0.5	4	TAC275K015P02
3.3	2	0.5	4	TAC335K015P02
3.9	2	0.5	4	TAC395K015P02
4.7	2	0.6	4	TAC475K015P02
5.6	2	0.7	4	TAC565K015P02
6.8	2	0.8	6	TAC685K015P02
8.2	5	1.0	6	TAC825K015P05
10	5	1.2	6	TAC106K015P05
12	5	1.4	6	TAC126K015P05
15	5	1.5	6	TAC156K015P05
18	6	2.2	6	TAC186K015P06
22	6	2.6	6	TAC226K015P06
27	6	3.2	6	TAC276K015P06
33	6	4.0	6	TAC336K015P06
39	7	4.7	6	TAC396K015P07
47	7	5.0	6	TAC476K015P07
56	7	6.7	6	TAC566K015P07
68	7	8.2	6	TAC686K015P07
82	7	9.8	8	TAC826K015P07
100	7	10.0	8	TAC107K015P07
120	8	10.0	8	TAC127K015P08
150	8	10.0	8	TAC157K015P08

20 WVDC @ 85°C / 13 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @ +25°C 120 Hz	Catalog Number
1.0	1	0.5	4	TAC105K020P01
1.2	1	0.5	4	TAC125K020P01
1.5	1	0.5	4	TAC155K020P01
1.8	2	0.5	4	TAC185K020P02
2.2	2	0.5	4	TAC225K020P02
2.7	2	0.5	4	TAC275K020P02
3.3	2	0.5	4	TAC335K020P02
3.9	2	0.6	4	TAC395K020P02
4.7	2	0.8	4	TAC475K020P02
5.6	5	0.9	4	TAC565K020P05
6.8	5	1.1	6	TAC685K020P05
8.2	5	1.3	6	TAC825K020P05
10	5	1.6	6	TAC106K020P05
12	6	1.9	6	TAC126K020P06
15	6	2.4	6	TAC156K020P06
18	6	2.9	6	TAC186K020P06
22	6	3.5	6	TAC226K020P06
27	7	4.3	6	TAC276K020P07
33	7	5.0	6	TAC336K020P07
39	7	6.2	6	TAC396K020P07
47	7	7.5	6	TAC476K020P07
56	7	8.9	6	TAC566K020P07
68	7	10.0	6	TAC686K020P07
82	8	10.0	8	TAC826K020P08
100	8	10.0	8	TAC107K020P08

25 WVDC @ 85°C / 17 WVDC @ 125°C

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @ +25°C 120 Hz	Catalog Number
0.47	1	0.5	3	TAC474K025P01
0.56	1	0.5	3	TAC564K025P01
0.68	1	0.5	3	TAC684K025P01
0.82	1	0.5	3	TAC824K025P01
1.0	1	0.5	3	TAC105K025P01
1.2	2	0.5	3	TAC125K025P02
1.5	2	0.5	3	TAC155K025P02
1.8	2	0.5	3	TAC185K025P02
2.2	2	0.5	3	TAC225K025P02
2.7	2	0.5	3	TAC275K025P02
3.3	2	0.7	3	TAC335K025P02
3.9	5	0.8	3	TAC395K025P05

NACC reserves the right to substitute a tighter tolerance, higher voltage capacitor within the same case size.

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type TAC
Solid Tantalum Capacitors

MALLORY

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
25 WVDC @ 85°C 17 WVDC @ 125°C				
4.7	5	0.9	4	TAC475K025P05
5.6	5	1.1	4	TAC565K025P05
6.8	5	1.4	4	TAC685K025P05
8.2	5	1.5	4	TAC825K025P05
10	5	1.5	4	TAC106K025P05
12	6	2.4	4	TAC126K025P06
15	6	3.0	4	TAC156K025P06
18	7	3.6	6	TAC186K025P07
22	7	4.4	6	TAC226K025P07
27	7	5.4	6	TAC276K025P07
33	7	6.6	6	TAC336K025P07
39	7	7.8	6	TAC396K025P07
47	7	9.4	6	TAC476K025P07
56	8	10.0	6	TAC566K025P08
68	8	10.0	6	TAC686K025P08
35 WVDC @ 85°C 23 WVDC @ 125°C				
0.10	1	0.5	3	TAC104K035P01
0.12	1	0.5	3	TAC124K035P01
0.15	1	0.5	3	TAC154K035P01
0.18	1	0.5	3	TAC184K035P01
0.22	1	0.5	3	TAC224K035P01
0.27	1	0.5	3	TAC274K035P01
0.33	1	0.5	3	TAC334K035P01

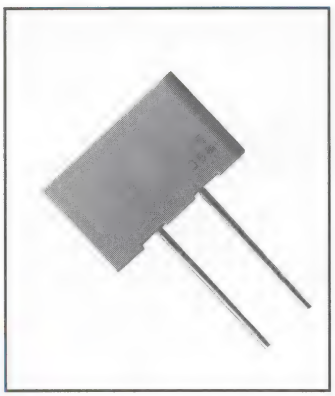
Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
35 WVDC @ 85°C 23 WVDC @ 125°C				
0.39	1	0.5	3	TAC394K035P01
0.47	1	0.5	3	TAC474K035P01
0.56	2	0.5	3	TAC564K035P02
0.68	2	0.5	3	TAC684K035P02
0.82	2	0.5	3	TAC824K035P02
1.0	2	0.5	3	TAC105K035P02
1.2	2	0.5	3	TAC125K035P02
1.5	2	0.5	3	TAC155K035P02
1.8	5	0.5	3	TAC185K035P05
2.2	5	0.6	3	TAC225K035P05
2.7	5	0.8	3	TAC275K035P05
3.3	5	0.9	4	TAC335K035P05
3.9	5	1.1	4	TAC395K035P05
4.7	5	1.3	4	TAC475K035P05
5.6	6	1.6	4	TAC565K035P06
6.8	6	1.9	4	TAC685K035P06
8.2	6	2.3	4	TAC825K035P06
10	6	2.8	4	TAC106K035P06
12	7	3.3	4	TAC126K035P07
15	7	4.2	6	TAC156K035P07
18	7	5.0	6	TAC186K035P07
22	7	6.2	6	TAC226K035P07
27	7	7.5	6	TAC276K035P07
33	7	9.2	6	TAC336K035P07
39	8	10.0	6	TAC396K035P08
47	8	10.0	6	TAC476K035P08

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
50 WVDC @ 85°C 33 WVDC @ 125°C				
0.10	1	0.5	3	TAC104K050P01
0.12	1	0.5	3	TAC124K050P01
0.15	1	0.5	3	TAC154K050P01
0.18	1	0.5	3	TAC184K050P01
0.22	1	0.5	3	TAC224K050P01
0.27	1	0.5	3	TAC274K050P01
0.33	2	0.5	3	TAC334K050P02
0.39	2	0.5	3	TAC394K050P02
0.47	2	0.5	3	TAC474K050P02
0.56	2	0.5	3	TAC564K050P02
0.68	2	0.5	3	TAC684K050P02
0.82	2	0.5	3	TAC824K050P02
1.0	2	0.5	3	TAC105K050P02
1.2	5	0.5	3	TAC125K050P05
1.5	5	0.6	4	TAC155K050P05
1.8	5	0.7	4	TAC185K050P05
2.2	5	0.9	4	TAC225K050P05
2.7	6	1.1	4	TAC275K050P06
3.3	6	1.3	4	TAC335K050P06
3.9	6	1.6	4	TAC395K050P06
4.7	6	1.9	4	TAC475K050P06
5.6	7	2.2	4	TAC565K050P07
6.8	7	2.7	4	TAC685K050P07
8.2	7	3.2	4	TAC825K050P07
10	7	4.0	6	TAC106K050P07
12	8	4.8	6	TAC126K050P08
15	8	6.0	6	TAC156K050P08
18	8	7.2	6	TAC186K050P08
22	8	8.8	6	TAC226K050P08

NACC reserves the right to substitute a tighter tolerance, higher voltage capacitor within the same case size.

Type TIM
Solid Tantalum Capacitors

MALLORY



- Precision Molded
- Radial Leads
- Low DCL
- Low ESR
- Excellent Temperature Stability
- Resistant to Shock & Vibration
- Standoffs for Easier Flux Removal
- Radius on Vertical Edge Allows for Polarization During Automatic Insertion
- Tape & Reel Optional

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(With proper derating)

Voltage Range:
6 to 50 WVDC @ 85°C

Capacitance Range:
.10 μF to 220 μF

Capacitance Tolerance:
±10%, ±20%

Capacitance Change Maximum:
-10% @ -55°C
+10% @ +85°C
+15% @ +125°C

DC Leakage:
25°C - See Table Limit
85°C - 10 x 25°C Limit
125°C - 12.5 x 25°C Limit

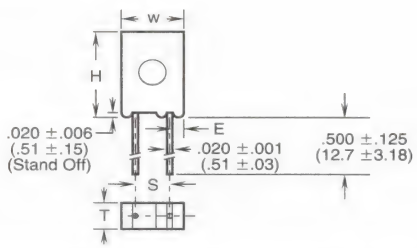
Maximum Power Dissipation:

Case	W & X	.090 Watts
Case	Y	.100 Watts
Case	Z	.125 Watts

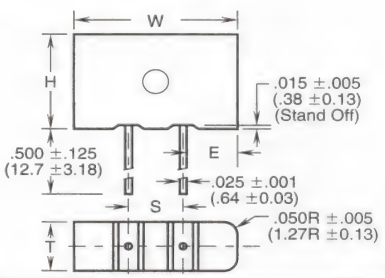
Reel Packaging per EIA-RS 468

Case Code	Quantity
W	1,500 per 14" Reel
X	1,500 per 14" Reel
Y	1,500 per 14" Reel
Z	N/A

W Case



X, Y, Z Cases



Note:
On the 'X' case size, the standoff appears only between the two leads

Dimensions - Inches (Millimeters)

Case Code	H Case Height	W Case Width	T Case Thickness	E Case to Wire	S Lead Spacing
W	.345 ±.008 (8.76 ±.203)	.230 ±.005 (5.84 ±.127)	.105 ±.005 (2.67 ±.127)	.050 ±.010 (1.27 ±0.25)	.125 ±.005 (3.18 ±.127)
X	.225 ±.015 (5.71 ±0.38)	.285 ±.015 (7.24 ±0.38)	.170 ±.015 (4.32 ±0.38)	.042 ±.010 (1.07 ±0.25)	.200 ±.005 (5.08 ±.127)
Y	.325 ±.015 (8.26 ±0.38)	.325 ±.015 (8.26 ±0.38)	.170 ±.015 (4.32 ±0.38)	.062 ±.010 (1.57 ±0.25)	.200 ±.005 (5.08 ±.127)
Z	.375 ±.015 (9.53 ±0.38)	.600 ±.015 (15.24 ±0.38)	.195 ±.015 (4.95 ±0.38)	.200 ±.010 (5.08 ±0.25)	.200 ±.005 (5.08 ±.127)

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Max Ripple mA rms @ 120Hz +25°C	Max Ripple mA rms @ 1kHz +25°C	Catalog Number
6 WVDC @ 85°C 4 WVDC @ 125°C						
22	X	1	6	35	290	TIM226*006P0X
56	Y	5	6	89	570	TIM566*006P0Y
68	Y	5	6	100	630	TIM686*006P0Y
220	Z	10	6	350	1000	TIM227*006P0Z
10 WVDC @ 85°C 7 WVDC @ 125°C						
10	W	1	6	26	220	TIM106*010P0W
15	W	1	6	39	270	TIM156*010P0W
6.8	X	1	6	18	150	TIM685*010P0X
10	X	1	6	26	220	TIM106*010P0X
15	X	1	6	39	270	TIM156*010P0X
22	Y	2	6	58	360	TIM226*010P0Y
33	Y	2	6	87	440	TIM336*010P0Y
39	Y	5	6	100	480	TIM396*010P0Y
47	Y	5	6	120	590	TIM476*010P0Y
56	Y	5	6	140	650	TIM566*010P0Y
150	Z	10	6	390	920	TIM157*010P0Z

* Indicate capacitance tolerance: K = ±10%, M = ±20%

Cap (μF)	Case Code	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Max Ripple mA rms @ 120Hz +25°C	Max Ripple mA rms @ 1kHz +25°C	Catalog Number
15 WVDC @ 85°C 10 WVDC @ 125°C						
5.6	X	1	6	22	180	TIM565*015P0X
6.8	X	1	6	27	180	TIM685*015P0X
8.2	X	1	6	32	200	TIM825*015P0X
10	Y	1	6	35	270	TIM106*015P0Y
15	Y	2	6	59	290	TIM156*015P0Y
22	Y	5	6	87	360	TIM226*015P0Y
27	Y	5	6	100	390	TIM276*015P0Y
33	Y	5	6	130	440	TIM336*015P0Y
20 WVDC @ 85°C 13 WVDC @ 125°C						
5.6	W	1	6	29	180	TIM565*020P0W
6.8	W	1	6	36	200	TIM685*020P0W
25 WVDC @ 85°C 17 WVDC @ 125°C						
1.0	X	1	6	9.3	77	TIM105*025P0X
3.3	W	1	4	21	150	TIM335*025P0W
3.3	X	1	6	21	150	TIM335*025P0X
4.7	X	1	6	31	180	TIM475*025P0X
6.8	Y	1	6	45	200	TIM685*025P0Y

NACC reserves the right to substitute a tighter tolerance, higher voltage capacitor within the same case size.

Type TIM
Solid Tantalum Capacitors

MALLORY

Cap (µF)	Case Code	Max DCL @ +25°C (µA)	Max D.F. % @ +25°C 120 Hz	Max Ripple mA rms @ 120Hz +25°C	Max Ripple mA rms @ 1kHz +25°C	Catalog Number
25 WVDC @ 85°C 17 WVDC @ 125°C						
10	X	1	6	40	190	TIM106*025P0X
10	Y	1	6	66	240	TIM106*025P0Y
12	Y	1	6	79	260	TIM126*025P0Y
15	Y	2	6	99	290	TIM156*025P0Y
35 WVDC @ 85°C 23 WVDC @ 125°C						
2.2	W	1	4	20	120	TIM225*035P0W
2.7	W	1	4	25	140	TIM275*035P0W
0.10	X	1	6	1.0	9.0	TIM104*035P0X
0.22	X	1	6	2.0	17	TIM224*035P0X
0.47	X	1	6	4.3	36	TIM474*035P0X
1.0	X	1	6	9.3	77	TIM105*035P0X
2.2	X	1	6	20	120	TIM225*035P0X
3.3	X	1	6	30	150	TIM335*035P0X
3.9	Y	1	6	35	180	TIM395*035P0Y
4.7	X	1	6	32	155	TIM475*035P0X
4.7	Y	1	6	43	200	TIM475*035P0Y
6.8	Y	2	6	63	210	TIM685*035P0Y
8.2	Y	5	6	76	220	TIM825*035P0Y
10	Y	5	6	93	240	TIM106*035P0Y
22	Z	10	6	200	400	TIM226*035P0Z
27	Z	10	6	250	450	TIM276*035P0Z
33	Z	10	6	300	490	TIM336*035P0Z

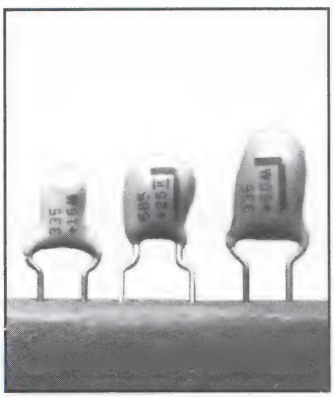
* Indicate capacitance tolerance: K = ±10%, M = ±20%

Cap (µF)	Case Code	Max DCL @ +25°C (µA)	Max D.F. % @ +25°C 120 Hz	Max Ripple mA rms @ 120Hz +25°C	Max Ripple mA rms @ 1kHz +25°C	Catalog Number
50 WVDC @ 85°C 33 WVDC @ 125°C						
0.10	X	1	6	1.3	11	TIM104*050P0X
0.22	X	1	6	2.9	24	TIM224*050P0X
0.33	X	1	6	4.4	36	TIM334*050P0X
1.0	W	1	4	13	86	TIM105*050P0W
1.0	X	1	6	13	87	TIM105*050P0X
1.5	W	1	4	19	100	TIM155*050P0W
1.5	X	1	6	19	100	TIM155*050P0X
2.2	X	1	6	29	120	TIM225*050P0X
4.7	Y	5	6	62	200	TIM475*050P0Y
5.6	Y	5	6	74	220	TIM565*050P0Y
6.8	Z	5	6	90	220	TIM685*050P0Z
10	Z	5	6	130	270	TIM106*050P0Z
15	Z	10	6	190	330	TIM156*050P0Z

NACC reserves the right to substitute a tighter tolerance, higher voltage capacitor within the same case size.

Type TDC
Solid Tantalum Capacitors

MALLORY



- Tough Plastic Case
- UL94V0 Flammability Rating
- Laser Marking Clarity and Permanence
- Low Cost
- Low DCL
- Low ESR & Impedance
- Temperature Stable
- Long Shelf Life
- High Shock & Vibration
- Optional Reel Packaging Available

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(With proper derating)

Voltage Range:
6 to 50 WVDC @ 85°C

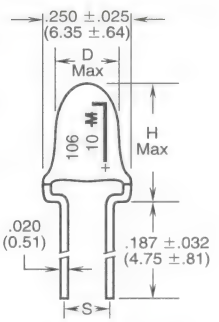
Reverse Voltage (Non-continuous):
15% of rated voltage @ 25°C
5% of rated voltage @ 85°C
1% of rated voltage @ 125°C

Capacitance Range:
.10 μF to 330 μF

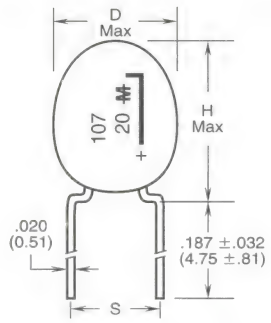
Capacitance Tolerance:
±10%, ±20%
(±5% by special order)

Capacitance Change From Initial +25°C Value:
-10% @ -55°C
+10% @ +85°C
+12% @ +125°C

DC Leakage:
At +25°C - See Table Limit
At +85°C - 10 x Table Limit
At +125°C - 12.5 x Table Limit



E and F Case Codes:
Lead Spacing = .125 ±.025 (3.17 ±.64)



G Case Code:
Lead Spacing = .250 ±.025 (6.35 ±.64)

Dimensions - Inches (Millimeters)

Case Code	D (Max.)	H (Max.)	Leads S	Leads Code
E	.175 (4.45)	.350 (8.89)	.125 (3.17) (Standard)	N
			.250 (6.35) (Special)	W
F	.250 (6.35)	.500 (12.7)	.125 (3.17) (Standard)	N
			.250 (6.35) (Special)	W
G	.350 (8.89)	.650 (16.51)	.250 (6.35) (Standard)	W

Case Code	Quantity
E	1,000
F	1,000
G	1,000

Catalog Numbers listed below reflect dimensions and lead forms as shown in the outline drawing. Other lead spacing and lead lengths of .500 (12.7) minimum are available by special order.

Cap (μF)	Case Code	Lead Spacing S	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
6 WVDC; 8 VDC Surge @ 85°C 4 WVDC; 5 VDC Surge @ 125@°C					
3.3	E	.125	0.5	5	TDC335*006NSE
3.9	E	.125	0.5	5	TDC395*006NSE
4.7	E	.125	0.5	5	TDC475*006NSE
5.6	E	.125	0.5	5	TDC565*006NSE
6.8	E	.125	0.5	5	TDC685*006NSE
8.2	E	.125	0.5	6	TDC825*006NSE
10	E	.125	0.5	6	TDC106*006NSE
12	E	.125	0.6	6	TDC126*006NSE
15	F	.125	0.7	6	TDC156*006NSF
18	F	.125	0.9	6	TDC186*006NSF
22	F	.125	1.1	6	TDC226*006NSF
27	F	.125	1.3	6	TDC276*006NSF
33	F	.125	1.6	6	TDC336*006NSF
39	F	.125	1.9	6	TDC396*006NSF
47	F	.125	2.3	6	TDC476*006NSF
56	F	.125	2.7	6	TDC566*006NSF
68	F	.125	3.3	6	TDC686*006NSF
82	F	.125	3.9	8	TDC826*006NSF
100	F	.125	4.8	8	TDC107*006NSF
120	G	.250	5.8	8	TDC127*006WSG
150	G	.250	7.2	8	TDC157*006WSG
180	G	.250	8.6	8	TDC187*006WSG
220	G	.250	10.0	8	TDC227*006WSG
270	G	.250	10.0	8	TDC277*006WSG
330	G	.250	10.0	8	TDC337*006WSG
10 WVDC; 13 VDC Surge @ 85°C 7 WVDC; 9 VDC Surge @ 125°C					
2.2	E	.125	0.5	5	TDC225*010NSE
2.7	E	.125	0.5	5	TDC275*010NSE
3.3	E	.125	0.5	5	TDC335*010NSE

Cap (μF)	Case Code	Lead Spacing S	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
10 WVDC; 13 VDC Surge @ 85°C 7 WVDC; 9 VDC Surge @ 125°C					
3.9	E	.125	0.5	5	TDC395*010NSE
4.7	E	.125	0.5	5	TDC475*010NSE
5.6	E	.125	0.5	5	TDC565*010NSE
6.8	E	.125	0.5	5	TDC685*010NSE
8.2	E	.125	0.7	6	TDC825*010NSE
10	F	.125	0.8	6	TDC106*010NSF
12	F	.125	1.0	6	TDC126*010NSF
15	F	.125	1.2	6	TDC156*010NSF
18	F	.125	1.4	6	TDC186*010NSF
22	F	.125	1.8	6	TDC226*010NSF
27	F	.125	2.2	6	TDC276*010NSF
33	F	.125	2.6	6	TDC336*010NSF
39	F	.125	3.1	6	TDC396*010NSF
47	F	.125	3.8	6	TDC476*010NSF
56	F	.125	4.5	6	TDC566*010NSF
68	F	.125	5.4	6	TDC686*010NSF
82	G	.250	6.6	8	TDC826*010WSG
100	G	.250	8.0	8	TDC107*010WSG
120	G	.250	9.6	8	TDC127*010WSG
150	G	.250	10.0	8	TDC157*010WSG
180	G	.250	10.0	8	TDC187*010WSG
220	G	.250	10.0	8	TDC227*010WSG
15 WVDC; 20 VDC Surge @ 85°C 10 WVDC; 12 VDC Surge @ 125°C					
1.5	E	.125	0.5	5	TDC155*015NSE
1.8	E	.125	0.5	5	TDC185*015NSE
2.2	E	.125	0.5	5	TDC225*015NSE
2.7	E	.125	0.5	5	TDC275*015NSE
3.3	E	.125	0.5	5	TDC335*015NSE
3.9	E	.125	0.5	5	TDC395*015NSE

* Indicate capacitance tolerance: K = ±10%, M = ±20%, (J = ±5%, Special Order)

NACC reserves the right to substitute a tighter tolerance, higher voltage capacitor within the same case size.

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type TDC
Solid Tantalum Capacitors

MALLORY

Cap (µF)	Case Code	Lead Spacing S	Max DCL @ +25°C (µA)	Max D.F. % @+25°C 120 Hz	Catalog Number
15 WVDC; 20 VDC Surge @ 85°C 10 WVDC; 12 VDC Surge @ 125°C					
4.7	E	.125	0.6	5	TDC475*015NSE
5.6	E	.125	0.7	5	TDC565*015NSE
6.8	E	.125	0.9	5	TDC685*015NSE
8.2	E	.125	1.0	6	TDC825*015NSE
10	F	.125	1.3	6	TDC106*015NSF
12	F	.125	1.5	6	TDC126*015NSF
15	F	.125	1.8	6	TDC156*015NSF
18	F	.125	2.2	6	TDC186*015NSF
22	F	.125	2.6	6	TDC226*015NSF
27	F	.125	3.2	6	TDC276*015NSF
33	F	.125	4.0	6	TDC336*015NSF
39	G	.250	4.7	6	TDC396*015WSG
47	G	.250	5.6	6	TDC476*015WSG
56	G	.250	6.8	6	TDC566*015WSG
68	G	.250	8.2	6	TDC686*015WSG
82	G	.250	9.8	8	TDC826*015WSG
100	G	.250	10.0	8	TDC107*015WSG
120	G	.250	10.0	8	TDC127*015WSG
150	G	.250	10.0	8	TDC157*015WSG
20 WVDC; 26 VDC Surge @ 85°C 13 WVDC; 16 VDC Surge @ 125°C					
1.0	E	.125	0.5	3	TDC105*020NSE
1.2	E	.125	0.5	5	TDC125*020NSE
1.5	E	.125	0.5	5	TDC155*020NSE
1.8	E	.125	0.5	5	TDC185*020NSE
2.2	E	.125	0.5	5	TDC225*020NSE
2.7	E	.125	0.5	5	TDC275*020NSE
3.3	E	.125	0.5	5	TDC335*020NSE
3.9	E	.125	0.6	5	TDC395*020NSE
4.7	E	.125	0.8	5	TDC475*020NSE
5.6	F	.125	0.9	5	TDC565*020NSF
6.8	F	.125	1.1	5	TDC685*020NSF
8.2	F	.125	1.3	6	TDC825*020NSF
10	F	.125	1.6	6	TDC106*020NSF
12	F	.125	1.9	6	TDC126*020NSF
15	F	.125	2.4	6	TDC156*020NSF
18	F	.125	2.9	6	TDC186*020NSF
22	F	.125	3.5	6	TDC226*020NSF
33	G	.250	5.3	6	TDC336*020WSG
39	G	.250	6.2	6	TDC396*020WSG
47	G	.250	7.5	6	TDC476*020WSG
56	G	.250	9.0	6	TDC566*020WSG
68	G	.250	10.0	6	TDC686*020WSG
82	G	.250	10.0	8	TDC826*020WSG
100	G	.250	10.0	8	TDC107*020WSG
25 WVDC; 32 VDC Surge @ 85°C 17 WVDC; 22 VDC Surge @ 125°C					
1.0	E	.125	0.5	3	TDC105*025NSE
1.2	E	.125	0.5	5	TDC125*025NSE
1.5	E	.125	0.5	5	TDC155*025NSE
1.8	E	.125	0.5	5	TDC185*025NSE
2.2	E	.125	0.5	5	TDC225*025NSE
2.7	E	.125	0.5	5	TDC275*025NSE
3.3	E	.125	0.7	5	TDC335*025NSE
3.9	E	.125	0.8	5	TDC395*025NSE
4.7	F	.125	0.9	5	TDC475*025NSF
5.6	F	.125	1.1	5	TDC565*025NSF
6.8	F	.125	1.4	5	TDC685*025NSF
8.2	F	.125	1.6	6	TDC825*025NSF
10	F	.125	2.0	6	TDC106*025NSF
12	F	.125	2.4	6	TDC126*025NSF
15	F	.125	3.0	6	TDC156*025NSF
18	F	.125	3.6	6	TDC186*025NSF
22	F	.125	4.4	6	TDC226*025NSF
27	G	.250	5.4	6	TDC276*025WSG
33	G	.250	6.6	6	TDC336*025WSG
39	G	.250	7.8	6	TDC396*025WSG
47	G	.250	9.4	6	TDC476*025WSG

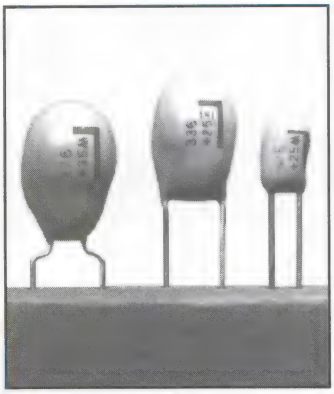
Cap (µF)	Case Code	Lead Spacing S	Max DCL @ +25°C (µA)	Max D.F. % @+25°C 120 Hz	Catalog Number
25 WVDC; 32 VDC Surge @ 85°C 17 WVDC; 22 VDC Surge @ 125°C					
56	G	.250	10.0	6	TDC566*025WSG
68	G	.250	10.0	6	TDC686*025WSG
35 WVDC; 46 VDC Surge @ 85°C 23 WVDC; 28 VDC Surge @ 125°C					
0.10	E	.125	0.5	3	TDC104*035NSE
0.12	E	.125	0.5	3	TDC124*035NSE
0.15	E	.125	0.5	3	TDC154*035NSE
0.18	E	.125	0.5	3	TDC184*035NSE
0.22	E	.125	0.5	3	TDC224*035NSE
0.27	E	.125	0.5	3	TDC274*035NSE
0.33	E	.125	0.5	3	TDC334*035NSE
0.39	E	.125	0.5	3	TDC394*035NSE
0.47	E	.125	0.5	3	TDC474*035NSE
0.56	E	.125	0.5	3	TDC564*035NSE
0.68	E	.125	0.5	3	TDC684*035NSE
0.82	E	.125	0.5	3	TDC824*035NSE
1.0	E	.125	0.5	3	TDC105*035NSE
1.2	E	.125	0.5	5	TDC125*035NSE
1.5	E	.125	0.5	5	TDC155*035NSE
1.8	E	.125	0.5	5	TDC185*035NSE
2.2	E	.125	0.6	5	TDC225*035NSE
2.7	F	.125	0.7	5	TDC275*035NSF
3.3	F	.125	0.9	5	TDC335*035NSF
3.9	F	.125	1.0	5	TDC395*035NSF
4.7	F	.125	1.3	5	TDC475*035NSF
5.6	F	.125	1.6	5	TDC565*035NSF
6.8	F	.125	1.9	5	TDC685*035NSF
8.2	F	.125	2.3	6	TDC825*035NSF
10	F	.125	2.8	6	TDC106*035NSF
12	G	.250	3.4	6	TDC126*035WSG
15	G	.250	4.2	6	TDC156*035WSG
18	G	.250	5.0	6	TDC186*035WSG
22	G	.250	6.2	6	TDC226*035WSG
27	G	.250	7.6	6	TDC276*035WSG
33	G	.250	9.2	6	TDC336*035WSG
39	G	.250	10.0	6	TDC396*035WSG
47	G	.250	10.0	6	TDC476*035WSG
50 WVDC; 65 VDC Surge @ 85°C 33 WVDC; 40 VDC Surge @ 125°C					
0.10	E	.125	0.5	3	TDC104*050NSE
0.12	E	.125	0.5	3	TDC124*050NSE
0.15	E	.125	0.5	3	TDC154*050NSE
0.18	E	.125	0.5	3	TDC184*050NSE
0.22	E	.125	0.5	3	TDC224*050NSE
0.27	E	.125	0.5	3	TDC274*050NSE
0.33	E	.125	0.5	3	TDC334*050NSE
0.39	E	.125	0.5	3	TDC394*050NSE
0.47	E	.125	0.5	3	TDC474*050NSE
0.56	E	.125	0.5	3	TDC564*050NSE
0.68	E	.125	0.5	3	TDC684*050NSE
0.82	E	.125	0.5	3	TDC824*050NSE
1.0	E	.125	0.5	3	TDC105*050NSE
1.2	E	.125	0.5	5	TDC125*050NSE
1.5	E	.125	0.6	5	TDC155*050NSE
1.8	F	.125	0.7	5	TDC185*050NSF
2.2	F	.125	0.9	5	TDC225*050NSF
2.7	F	.125	1.1	5	TDC275*050NSF
3.3	F	.125	1.3	5	TDC335*050NSF
3.9	F	.125	1.6	5	TDC395*050NSF
4.7	F	.125	1.9	5	TDC475*050NSF
5.6	F	.125	2.2	5	TDC565*050NSF
6.8	G	.250	2.7	5	TDC685*050WSG
8.2	G	.250	3.3	6	TDC825*050WSG
10	G	.250	4.0	6	TDC106*050WSG
12	G	.250	4.8	6	TDC126*050WSG
15	G	.250	6.0	6	TDC156*050WSG
18	G	.250	7.2	6	TDC186*050WSG
22	G	.250	8.8	6	TDC226*050WSG

* Indicate capacitance tolerance: K = ±10%, M = ±20%, (J = ±5%, Special Order)

NACC reserves the right to substitute a tighter tolerance, higher voltage capacitor within the same case size.

Type TDL
Solid Tantalum Capacitors

MALLORY



- Tough Plastic Case
- UL94V0 Flammability Rating
- Laser Marking Clarity and Permanence
- Low Cost
- Low DCL
- Low ESR & Impedance
- Temperature Stable
- Long Shelf Life
- High Shock & Vibration
- Optional Reel Packaging Available

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(With proper derating)

Voltage Range:
6 to 50 WVDC @ 85°C

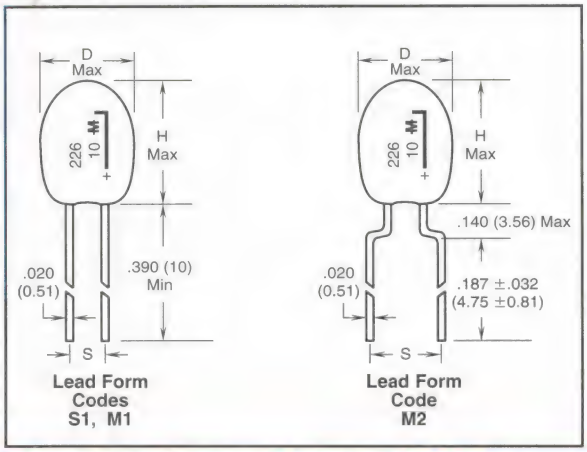
Reverse Voltage (Non-continuous):
15% of rated voltage @ 25°C
5% of rated voltage @ 85°C
1% of rated voltage @ 125°C

Capacitance Range:
.10 μF to 330 μF

Capacitance Tolerance:
±10%, ±20%
(±5% by special order)

Capacitance Change From Initial +25°C Value:
-10% @ -55°C
+10% @ +85°C
+12% @ +125°C

DC Leakage:
At +25°C - See Table Limit
At +85°C - 10 x Table Limit
At +125°C - 12.5 x Table Limit



Dimensions - Inches (Millimeters)

Case Code	D (Max.)	H (Max.)	Leads S	Leads Code	Quantity Per Reel
A	.180 (4.57)	.280 (7.11)	.100 (2.54) (Standard) .200 (5.08) (Special)	S1 M2	1,500
B	..200 (5.08)	.300 (7.62)	.100 (2.54) (Standard) .200 (5.08) (Special)	S1 M2	1,500
C	.260 (6.60)	.360 (9.14)	.100 (2.54) (Standard) .200 (5.08) (Special)	S1 M2	1,500
D	.340 (8.64)	.400 (10.16)	.100 (2.54) (Standard) .200 (5.08) (Special)	S1 M2	1,000
E	.400 (10.16)	.560 (14.22)	.200 (5.08) (Standard)	M1	1,000
F	.440 (11.18)	.680 (17.27)	.200 (5.08) (Standard)	M1	1,000

Listed Catalog Numbers reflect standard lead forms as indicated below.
M2 lead form and lead lengths of .500 (12.7) minimum are available by special order.

6.3 WVDC; 8 VDC Surge @ 85°C
4 WVDC; 5 VDC Surge @ 125°C

Cap (μF)	Case Code	Lead Spacing S	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
3.3	A	.100	0.5	5	TDL335*006S1A
3.9	A	.100	0.5	5	TDL395*006S1A
4.7	A	.100	0.5	5	TDL475*006S1A
5.6	A	.100	0.5	5	TDL565*006S1A
6.8	A	.100	0.5	5	TDL685*006S1A
8.2	B	.100	0.5	6	TDL825*006S1B
10	B	.100	0.5	6	TDL106*006S1B
12	B	.100	0.6	6	TDL126*006S1B
15	B	.100	0.7	6	TDL156*006S1B
18	B	.100	0.9	6	TDL186*006S1B
22	C	.100	1.1	6	TDL226*006S1C
27	C	.100	1.3	6	TDL276*006S1C
33	C	.100	1.6	6	TDL336*006S1C
39	C	.100	1.9	6	TDL396*006S1C
47	D	.100	2.3	6	TDL476*006S1D
56	D	.100	2.7	6	TDL566*006S1D
68	D	.100	3.3	6	TDL686*006S1D
82	D	.100	3.9	8	TDL826*006S1D
100	D	.100	4.8	8	TDL107*006S1D
120	D	.200	5.8	8	TDL127*006M1D
150	E	.200	7.2	8	TDL157*006M1E
180	E	.200	8.6	8	TDL187*006M1E
220	E	.200	10.0	8	TDL227*006M1E
270	E	.200	10.0	8	TDL277*006M1E
330	F	.200	10.0	8	TDL337*006M1F

10 WVDC; 13 VDC Surge @ 85°C
7 WVDC: 9 VDC Surge @ 125°C

Cap (μF)	Case Code	Lead Spacing S	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
2.2	A	.100	0.5	5	TDL225*010S1A
2.7	A	.100	0.5	5	TDL275*010S1A
3.3	A	.100	0.5	5	TDL335*010S1A
3.9	A	.100	0.5	5	TDL395*010S1A

10 WVDC; 13 VDC Surge @ 85°C
7 WVDC; 9 VDC Surge @ 125°C

Cap (μF)	Case Code	Lead Spacing S	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
4.7	A	.100	0.5	5	TDL475*010S1A
5.6	A	.100	0.5	5	TDL565*010S1A
6.8	B	.100	0.5	5	TDL685*010S1B
8.2	B	.100	0.7	6	TDL825*010S1B
10	B	.100	0.8	6	TDL106*010S1B
12	C	.100	1.0	6	TDL126*010S1C
15	C	.100	1.2	6	TDL156*010S1C
18	C	.100	1.4	6	TDL186*010S1C
22	C	.100	1.8	6	TDL226*010S1C
27	C	.100	2.2	6	TDL276*010S1C
33	D	.100	2.6	6	TDL336*010S1D
39	D	.100	3.1	6	TDL396*010S1D
47	D	.100	3.8	6	TDL476*010S1D
56	D	.100	4.5	6	TDL566*010S1D
68	D	.100	5.4	6	TDL686*010S1D
82	E	.200	6.6	8	TDL826*010M1E
100	E	.200	8.0	8	TDL107*010M1E
120	E	.200	9.6	8	TDL127*010M1E
150	E	.200	10.0	8	TDL157*010M1E
180	E	.200	10.0	8	TDL187*010M1E
220	F	.200	10.0	8	TDL227*010M1F

16 WVDC; 20 VDC Surge @ 85°C
10 WVDC; 12 VDC Surge @ 125°C

Cap (μF)	Case Code	Lead Spacing S	Max DCL @ +25°C (μA)	Max D.F. % @+25°C 120 Hz	Catalog Number
1.5	A	.100	0.5	5	TDL155*016S1A
1.8	A	.100	0.5	5	TDL185*016S1A
2.2	A	.100	0.5	5	TDL225*016S1A
2.7	A	.100	0.5	5	TDL275*016S1A
3.3	A	.100	0.5	5	TDL335*016S1A
3.9	B	.100	0.5	5	TDL395*016S1B
4.7	B	.100	0.6	5	TDL475*016S1B
5.6	B	.100	0.7	5	TDL565*016S1B

* Indicate capacitance tolerance: K = ±10%, M = ±20%, (J = ±5%, Special Order)

NACC reserves the right to substitute a tighter tolerance, higher voltage capacitor within the same case size.

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type TDL
Solid Tantalum Capacitors

MALLORY

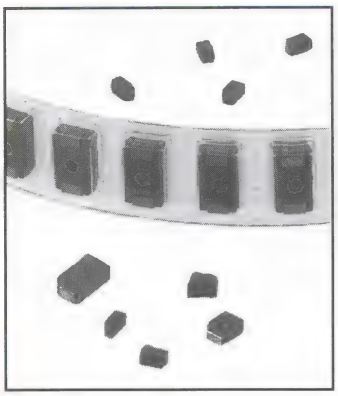
Cap (µF)	Case Code	Lead Spacing S	Max DCL @ +25°C (µA)	Max D.F. % @+25°C 120 Hz	Catalog Number
16 WVDC; 20 VDC Surge @ 85°C 10 WVDC; 12 VDC Surge @ 125°C					
6.8	B	.100	0.9	5	TDL685*016S1B
8.2	C	.100	1.0	6	TDL825*016S1C
10	C	.100	1.3	6	TDL106*016S1C
12	C	.100	1.5	6	TDL126*016S1C
15	C	.100	1.8	6	TDL156*016S1C
18	C	.100	2.2	6	TDL186*016S1C
22	D	.100	2.6	6	TDL226*016S1D
27	D	.100	3.2	6	TDL276*016S1D
33	D	.100	4.0	6	TDL336*016S1D
39	E	.200	4.7	6	TDL396*016M1E
47	E	.200	5.6	6	TDL476*016M1E
56	E	.200	6.8	6	TDL566*016M1E
68	E	.200	8.2	6	TDL686*016M1E
82	E	.200	9.8	8	TDL826*016M1E
100	F	.200	10.0	8	TDL107*016M1F
120	F	.200	10.0	8	TDL127*016M1F
150	F	.200	10.0	8	TDL157*016M1F
20 WVDC; 26 VDC Surge @ 85°C 13 WVDC; 16 VDC Surge @ 125°C					
1.0	A	.100	0.5	3	TDL105*020S1A
1.2	A	.100	0.5	5	TDL125*020S1A
1.5	A	.100	0.5	5	TDL155*020S1A
1.8	A	.100	0.5	5	TDL185*020S1A
2.2	A	.100	0.5	5	TDL225*020S1A
2.7	A	.100	0.5	5	TDL275*020S1A
3.3	A	.100	0.5	5	TDL335*020S1A
3.9	B	.100	0.6	5	TDL395*020S1B
4.7	B	.100	0.8	5	TDL475*020S1B
5.6	B	.100	0.9	5	TDL565*020S1B
6.8	B	.100	1.1	5	TDL685*020S1B
8.2	B	.100	1.3	6	TDL825*020S1B
10	C	.100	1.6	6	TDL106*020S1C
12	C	.100	1.9	6	TDL126*020S1C
15	C	.100	2.4	6	TDL156*020S1C
18	C	.100	2.9	6	TDL186*020S1C
22	C	.100	3.5	6	TDL226*020S1C
27	E	.200	4.3	6	TDL276*020M1E
33	E	.200	5.3	6	TDL336*020M1E
39	E	.200	6.2	6	TDL396*020M1E
47	E	.200	7.5	6	TDL476*020M1E
56	E	.200	9.0	6	TDL566*020M1E
68	E	.200	10.0	6	TDL686*020M1E
82	F	.200	10.0	8	TDL826*020M1F
100	F	.200	10.0	8	TDL107*020M1F
25 WVDC; 32 VDC Surge @ 85°C 16.5 WVDC; 21.5 VDC Surge @ 125°C					
1.0	A	.100	0.5	3	TDL105*025S1A
1.2	A	.100	0.5	5	TDL125*025S1A
1.5	A	.100	0.5	5	TDL155*025S1A
1.8	A	.100	0.5	5	TDL185*025S1A
2.2	B	.100	0.5	5	TDL225*025S1B
2.7	B	.100	0.5	5	TDL275*025S1B
3.3	B	.100	0.7	5	TDL335*025S1B
3.9	B	.100	0.8	5	TDL395*025S1B
4.7	C	.100	0.9	5	TDL475*025S1C
5.6	C	.100	1.1	5	TDL565*025S1C
6.8	C	.100	1.4	5	TDL685*025S1C
8.2	C	.100	1.6	6	TDL825*025S1C
10	C	.100	2.0	6	TDL106*025S1C
12	C	.100	2.4	6	TDL126*025S1C
15	D	.100	3.0	6	TDL156*025S1D
18	D	.100	3.6	6	TDL186*025S1D
22	D	.100	4.4	6	TDL226*025S1D
27	E	.100	5.4	6	TDL276*025M1E
33	E	.100	6.6	6	TDL336*025M1E
39	E	.100	7.8	6	TDL396*025M1E
47	E	.100	9.4	6	TDL476*025M1E
56	E	.100	10.0	6	TDL566*025M1E
68	F	.100	10.0	6	TDL686*025M1F
35 WVDC; 46 VDC Surge @ 85°C 23 WVDC; 28 VDC Surge @ 125°C					
0.10	A	.100	0.5	3	TDL104*035S1A
0.12	A	.100	0.5	3	TDL124*035S1A
0.15	A	.100	0.5	3	TDL154*035S1A
0.18	A	.100	0.5	3	TDL184*035S1A
0.22	A	.100	0.5	3	TDL224*035S1A
0.27	A	.100	0.5	3	TDL274*035S1A
0.33	A	.100	0.5	3	TDL334*035S1A
0.39	A	.100	0.5	3	TDL394*035S1A
0.47	A	.100	0.5	3	TDL474*035S1A
0.56	A	.100	0.5	3	TDL564*035S1A
0.68	A	.100	0.5	3	TDL684*035S1A
0.82	A	.100	0.5	3	TDL824*035S1A
1.0	B	.100	0.5	3	TDL105*035S1B
1.2	B	.100	0.5	5	TDL125*035S1B
1.5	B	.100	0.5	5	TDL155*035S1B
1.8	B	.100	0.5	5	TDL185*035S1B
2.2	C	.100	0.6	5	TDL225*035S1C
2.7	C	.100	0.7	5	TDL275*035S1C
3.3	C	.100	0.9	5	TDL335*035S1C
3.9	C	.100	1.0	5	TDL395*035S1C
4.7	D	.100	1.3	5	TDL475*035S1D
5.6	D	.100	1.6	5	TDL565*035S1D
6.8	D	.100	1.9	5	TDL685*035S1D
8.2	D	.100	2.3	6	TDL825*035S1D
10	D	.100	2.8	6	TDL106*035S1D
12	E	.200	3.4	6	TDL126*035M1E
15	E	.200	4.2	6	TDL156*035M1E
18	E	.200	5.0	6	TDL186*035M1E
22	E	.200	6.2	6	TDL226*035M1E
27	E	.200	7.6	6	TDL276*035M1E
33	F	.200	9.2	6	TDL336*035M1F
39	F	.200	10.0	6	TDL396*035M1F
47	F	.200	10.0	6	TDL476*035M1F
50 WVDC; 65 VDC Surge @ 85°C 33 WVDC; 40 VDC Surge @ 125°C					
0.10	A	.100	0.5	3	TDL104*050S1A
0.12	A	.100	0.5	3	TDL124*050S1A
0.15	A	.100	0.5	3	TDL154*050S1A
0.18	A	.100	0.5	3	TDL184*050S1A
0.22	A	.100	0.5	3	TDL224*050S1A
0.27	A	.100	0.5	3	TDL274*050S1A
0.33	A	.100	0.5	3	TDL334*050S1A
0.39	A	.100	0.5	3	TDL394*050S1A
0.47	B	.100	0.5	3	TDL474*050S1B
0.56	B	.100	0.5	3	TDL564*050S1B
0.68	B	.100	0.5	3	TDL684*050S1B
0.82	B	.100	0.5	3	TDL824*050S1B
1.0	C	.100	0.5	3	TDL105*050S1C
1.2	C	.100	0.5	5	TDL125*050S1C
1.5	C	.100	0.6	5	TDL155*050S1C
1.8	C	.100	0.7	5	TDL185*050S1C
2.2	D	.100	0.9	5	TDL225*050S1D
2.7	D	.100	1.1	5	TDL275*050S1D
3.3	D	.100	1.3	5	TDL335*050S1D
3.9	D	.100	1.6	5	TDL395*050S1D
4.7	D	.100	1.9	5	TDL475*050S1D
5.6	D	.100	2.2	5	TDL565*050S1D
6.8	F	.200	2.7	5	TDL685*050M1F
8.2	F	.200	3.3	6	TDL825*050M1F
10	F	.200	4.0	6	TDL106*050M1F
12	F	.200	4.8	6	TDL126*050M1F
15	F	.200	6.0	6	TDL156*050M1F
18	F	.200	7.2	6	TDL186*050M1F
22	F	.200	8.8	6	TDL226*050M1F

NACC reserves the right to substitute a tighter tolerance, higher voltage capacitor within the same case size.

* Indicate capacitance tolerance: K = ±10%, M = ±20%, (J = ±5%, Special Order)

Type T491 - Chips
Solid Tantalum Capacitors

MALLORY



- Highest Capacitance per Case
- Low DF and DC Leakage
- Temperature Stable
- Compatible with all Soldering Techniques
- Soldering Temperature up to 260°C for 10 Seconds
- Meets IECQ Standard QC300801/US0001 and EIA Standard 535BAAC
- Compatible with all Tape-Fed Automatic Pick and Place Systems

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(with proper derating)

Voltage Range:
4 to 50 VDC

Capacitance Range:
0.10 μF to 220 μF

Cap Change From Initial Limit
-10% @ -55°C; +10% @ +85°C
+12% @ +125°C

DC Leakage:
At 25°C -See P/N List
At 85°C - 10 x 25°C Limit
At 125°C - 12 x 25°C Limit

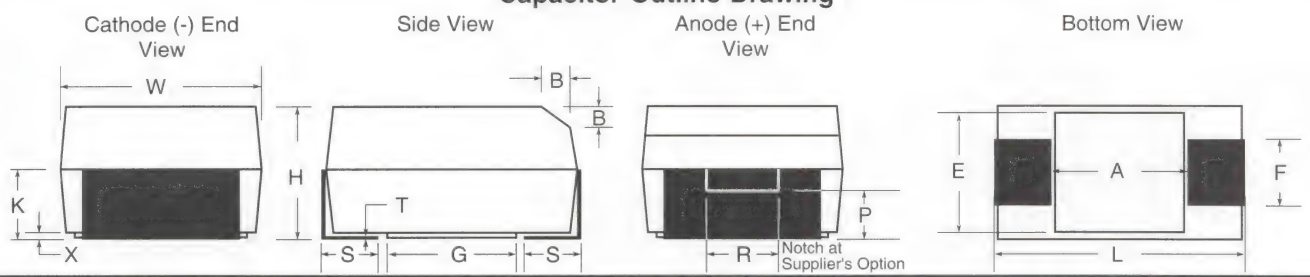
Dissipation Factor:
.1 μF to 1.0 μF — 4%
1.5 μF to 68 μF — 6%
100 μF to 220 μF — 8%

Standard Packaging
Tape & Reel per EIA RS-481-1

Case Code EIA/IECQ	Qty per 7"Reel	Tape Width	Tape Pitch
S 3216L	2,500	8mm	4mm
T 3528L	2,500	8mm	4mm
A 3216	2,000	8mm	4mm
B 3528	2,000	8mm	4mm
C 6032	500	12mm	8mm
D 7343	500	12mm	8mm
X 7343H	500	12mm	8mm

13" Reels Available on Special Order

Capacitor Outline Drawing



Case Code NACC	EIA/IECQ	L	W	H	K	F	S	B (Ref)	X (Ref)	P (Ref)	R (Ref)	T (Ref)	A (Min)	G (Ref)	E (Ref)
		Dimensions - Millimeters (Inches)													
A	3216	3.2 ± 0.2 (.126 ± .008)	1.6 ± 0.2 (.063 ± .008)	1.6 ± 0.2 (.063 ± .008)	0.9 ± 0.2 (.035 ± .008)	1.2 ± 0.1 (.047 ± .004)	0.8 ± 0.3 (.031 ± .012)	0.4 ± 0.15 (.016 ± .006)	0.10 ± 0.10 (.004 ± .004)	0.4 (.016)	0.4 (.016)	0.13 (.005)	0.8 (.031)	1.1 (.043)	1.3 (.051)
B	3528	3.5 ± 0.2 (.138 ± .008)	2.8 ± 0.2 (.110 ± .008)	1.9 ± 0.2 (.075 ± .008)	1.1 ± 0.2 (.043 ± .008)	2.2 ± 0.1 (.087 ± .004)	0.8 ± 0.3 (.031 ± .012)	0.4 ± 0.15 (.016 ± .006)	0.10 ± 0.10 (.004 ± .004)	0.5 (.020)	1.0 (.039)	0.13 (.005)	1.1 (.043)	1.8 (.071)	2.2 (.087)
C	6032	6.0 ± 0.3 (.236 ± .012)	3.2 ± 0.3 (.126 ± .012)	2.5 ± 0.3 (.098 ± .012)	1.4 ± 0.2 (.055 ± .008)	2.2 ± 0.1 (.087 ± .004)	1.3 ± 0.3 (.051 ± .012)	0.5 ± 0.15 (.020 ± .006)	0.10 ± 0.10 (.004 ± .004)	0.9 (.035)	1.0 (.039)	0.13 (.005)	2.5 (.098)	2.8 (.110)	2.9 (.114)
D	7343	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	2.8 ± 0.3 (.110 ± .012)	1.5 ± 0.2 (.059 ± .008)	2.4 ± 0.1 (.094 ± .004)	1.3 ± 0.3 (.051 ± .012)	0.5 ± 0.15 (.020 ± .006)	0.10 ± 0.10 (.004 ± .004)	0.9 (.035)	1.0 (.039)	0.13 (.005)	3.8 (.150)	3.5 (.138)	3.5 (.138)
X	7343H	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	4.0 ± 0.3 (.157 ± .012)	2.3 ± 0.2 (.091 ± .008)	2.4 ± 0.1 (.094 ± .004)	1.3 ± 0.3 (.051 ± .012)	0.5 ± 0.15 (.020 ± .006)	0.10 ± 0.10 (.004 ± .004)	1.7 (.067)	1.0 (.039)	0.13 (.005)	3.8 (.150)	3.5** (.138)	3.5** (.138)

Notes: 1 Metric dimensions govern
2 (Ref) - Dimensions provided for reference only
** Round Glue Pad 2.9 ±0.1mm (.114 ±.004) in diameter at Supplier's option

Low Profile Capacitors

Case Code NACC	EIA/IECQ	L	W	H Max.	K Min.	F	S	B (Ref)	X (Ref)	P (Ref)	R (Ref)	T (Ref)	A (Min)	G (Ref)	E (Ref)
		Dimensions - Millimeters (Inches)													
S	3216L	3.2 ± 0.2 (.126 ± .008)	1.6 ± 0.2 (.063 ± .008)	1.2 (.047)	0.3 (.012)	1.2 ± 0.1 (.047 ± .004)	0.8 ± 0.3 (.031 ± .012)	Note 3	0.05 (.002)	Note 3	Note 3	0.13 (.005)	0.8 (.031)	1.1 (.043)	1.3 (.051)
T	3528L	3.5 ± 0.2 (.138 ± .008)	2.8 ± 0.2 (.110 ± .008)	1.2 (.047)	0.3 (.012)	2.2 ± 0.1 (.087 ± .004)	0.8 ± 0.3 (.031 ± .012)	Note 3	0.05 (.002)	Note 3	Note 3	0.13 (.005)	1.1 (.043)	1.8 (.071)	2.2 (.087)

Notes: 1 Metric dimensions govern
2 (Ref) - Dimensions provided for reference only
3 No dimensions provided for B, P or R because low profile cases do not have a bevel or notch

Part Number Nomenclature

T491	B	105	K	035	A	S
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. T491 Series - Precision Molded Case
2. Case Size Code:
   S, T, A, B, C, D, X
3. Capacitance Code (Expressed in Picofarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 395 = 3.9 μF)
4. Capacitance Tolerance:
   K = ±10%, (M = ±20%, special order only)
5. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
6. Failure Rate: A = Not applicable
7. Lead Material
   S = Standard Solder Coated
   G = Gold Plated

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type T491 - Chips
Solid Tantalum Capacitors

MALLORY

Cap (µF)	* Cap Tol	Case Code		Catalog Number	DC Leakage µA @+25°C Max	DF % @ +25°C 120 Hz Max
		M	EIA/ IECQ			
4 WVDC @ +85°C (2.7 WVDC @ +125°C)						
+# 15	10%	T	3528L	T491T156K004AS	0.6	6.0
+# 33	10%	B	3528	T491B336K004AS	1.3	6.0
+ 68	10%	C	6032	T491C686K004AS	2.7	6.0
+# 100	10%	C	6032	T491C107K004AS	4.0	8.0
100	10%	D	7343	T491D107K004AS	4.0	8.0
+ 150	10%	D	7343	T491D157K004AS	6.0	8.0
✻ 6 WVDC @ +85°C (4 WVDC @ +125°C)						
+ 4.7	10%	A	3216	T491A475K006AS	0.5	6.0
+# 4.7	10%	S	3216L	T491S475K006AS	0.5	6.0
+ 6.8	10%	A	3216	T491A685K006AS	0.5	6.0
6.8	10%	B	3528	T491B685K006AS	0.5	6.0
+# 10	10%	A	3216	T491A106K006AS	0.6	6.0
10	10%	B	3528	T491B106K006AS	0.6	6.0
+# 10	10%	T	3528L	T491S106K006AS	0.6	6.0
+# 22	10%	B	3528	T491B226K006AS	1.4	6.0
22	10%	C	6032	T491C226K006AS	1.4	6.0
+ 33	10%	C	6032	T491C336K006AS	2.0	6.0
+ 47	10%	C	6032	T491C476K006AS	2.9	6.0
47	10%	D	7343	T491D476K006AS	2.9	6.0
+# 68	10%	C	6032	T491C686K006AS	4.1	6.0
+ 100	10%	D	7343	T491D107K006AS	6.0	8.0
+ 150	10%	D	7343	T491D157K006AS	9.0	8.0
+ 220	10%	X	7343H	T491X227K006AS	13.2	8.0
220	10%	D	7343	T491D227K006AS	13.2	8.0
330	10%	X	7343H	T491X337K006AS	19.8	8.0
10 WVDC @ +85°C (7 WVDC @ +125°C)						
2.2	10%	A	3216	T491A225K010AS	0.5	6.0
+ 3.3	10%	A	3216	T491A335K010AS	0.5	6.0
+# 3.3	10%	S	3216L	T491S335K010AS	0.5	6.0
+ 4.7	10%	A	3216	T491A475K010AS	0.5	6.0
4.7	10%	B	3528	T491B475K010AS	0.5	6.0
+# 6.8	10%	A	3216	T491A685K010AS	0.7	6.0
6.8	10%	B	3528	T491B685K010AS	0.7	6.0
+# 6.8	10%	T	3528L	T491T685K010AS	0.7	6.0
+ 10	10%	B	3528	T491B106K010AS	1.0	6.0
10	10%	C	6032	T491C106K010AS	1.0	6.0
+# 15	10%	B	3528	T491B156K010AS	1.5	6.0
+ 22	10%	C	6032	T491C226K010AS	2.2	6.0
+ 33	10%	C	6032	T491C336K010AS	3.3	6.0
+# 47	10%	C	6032	T491C476K010AS	4.7	6.0
47	10%	D	7343	T491D476K010AS	4.7	6.0
+ 68	10%	D	7343	T491D686K010AS	6.8	6.0
+ 100	10%	D	7343	T491D107K010AS	10.0	8.0
+ 150	10%	X	7343H	T491X157K010AS	15.0	8.0
220	10%	X	7343H	T491X227K010AS	22.0	8.0
16 WVDC @ +85°C (10 WVDC @ +125°C)						
1	10%	A	3216	T491A105K016AS	0.5	4.0
+ 2.2	10%	A	3216	T491A225K016AS	0.5	6.0
+# 2.2	10%	S	3216L	T491S225K016AS	0.5	6.0
+ 3.3	10%	A	3216	T491A335K016AS	0.5	6.0
3.3	10%	B	3528	T491B335K016AS	0.5	6.0
+# 4.7	10%	A	3216	T491A475K016AS	0.8	6.0
4.7	10%	B	3528	T491B475K016AS	0.8	6.0
+# 4.7	10%	T	3528L	T491T475K016AS	0.8	6.0
+ 6.8	10%	B	3528	T491B685K016AS	1.1	6.0
6.8	10%	C	6032	T491C685K016AS	1.1	6.0
+# 10	10%	B	3528	T491B106K016AS	1.6	6.0
10	10%	C	6032	T491C106K016AS	1.6	6.0
+ 15	10%	C	6032	T491C156K016AS	2.4	6.0

Cap (µF)	* Cap Tol	Case Code		Catalog Number	DC Leakage µA @+25°C Max	DF % @ +25°C 120 Hz Max
		M	EIA/ IECQ			
16 WVDC @ +85°C (10 WVDC @ +125°C)						
+ 22	10%	C	6032	T491C226K016AS	3.6	6.0
22	10%	D	7343	T491D226K016AS	3.6	6.0
+# 33	10%	C	6032	T491C336K016AS	5.3	6.0
33	10%	D	7343	T491D336K016AS	5.3	6.0
+ 47	10%	D	7343	T491D476K016AS	7.5	6.0
+ 68	10%	D	7343	T491D686K016AS	10.9	6.0
+ 100	10%	X	7343H	T491X107K016AS	16.0	8.0
150	10%	X	7343H	T491X157K016AS	24.0	8.0
20 WVDC @ +85°C (13 WVDC @ +125°C)						
1	10%	A	3216	T491A105K020AS	0.5	4.0
+ 1.5	10%	A	3216	T491A155K020AS	0.5	6.0
+# 1.5	10%	S	3216L	T491S155K020AS	0.5	6.0
+ 2.2	10%	A	3216	T491A225K020AS	0.5	6.0
2.2	10%	B	3528	T491B225K020AS	0.5	6.0
+# 3.3	10%	A	3216	T491A335K020AS	0.7	6.0
3.3	10%	B	3528	T491B335K020AS	0.7	6.0
+# 3.3	10%	T	3528L	T491T335K020AS	0.7	6.0
+ 4.7	10%	B	3528	T491B475K020AS	1.0	6.0
4.7	10%	C	6032	T491C475K020AS	1.0	6.0
+# 6.8	10%	B	3528	T491B685K020AS	1.4	6.0
6.8	10%	C	6032	T491C685K020AS	1.4	6.0
+ 10	10%	C	6032	T491C106K020AS	2.0	6.0
+ 15	10%	C	6032	T491C156K020AS	3.0	6.0
15	10%	D	7343	T491D156K020AS	3.0	6.0
+# 22	10%	C	6032	T491C226K020AS	4.4	6.0
22	10%	D	7343	T491D226K020AS	4.4	6.0
+ 33	10%	D	7343	T491D336K020AS	6.6	6.0
+ 47	10%	D	7343	T491D476K020AS	9.4	6.0
+ 68	10%	X	7343H	T491X686K020AS	13.6	6.0
100	10%	X	7343H	T491X107K020AS	20.0	8.0
25 WVDC @ +85°C (17 WVDC @ +125°C)						
0.47	10%	A	3216	T491A474K025AS	0.5	4.0
+ 0.68	10%	A	3216	T491A684K025AS	0.5	4.0
+ 1	10%	A	3216	T491A105K025AS	0.5	4.0
1	10%	B	3528	T491B105K025AS	0.5	4.0
1.5	10%	B	3528	T491B155K025AS	0.5	6.0
+ 2.2	10%	B	3528	T491B225K025AS	0.6	6.0
2.2	10%	C	6032	T491C225K025AS	0.6	6.0
3.3	10%	C	6032	T491C335K025AS	0.9	6.0
4.7	10%	C	6032	T491C475K025AS	1.2	6.0
+ 6.8	10%	C	6032	T491C685K025AS	1.7	6.0
+ 10	10%	C	6032	T491C106K025AS	2.5	6.0
10	10%	D	7343	T491D106K025AS	2.5	6.0
15	10%	D	7343	T491D156K025AS	3.8	6.0
+ 22	10%	D	7343	T491D226K025AS	5.5	6.0
+ 33	10%	X	7343H	T491X336K025AS	8.3	6.0

* - ± 20% Tolerance Available by Special Order
\+ - Extended Values
\# - Max Capacitance Change @ 125°C = +15% (All others are +12%)
✻ - 6 volt product is equivalent to 6.3 volt product

Note: NACC reserves the right to offer higher rated voltage substitutes within the same case size. The marking will indicate the higher voltage.

Type T491 - Chips
Solid Tantalum Capacitors

MALLORY

	Cap (µF)	* Cap Tol	Case Code M	Case Code EIA/IECQ	Catalog Number	DC Leakage µA @+25°C Max	DF % @ +25°C 120 Hz Max
	35 WVDC @ +85!C (23 WVDC @ +125!C)						
	0.1	10%	A	3216	T491A104K035AS	0.5	4.0
+	0.15	10%	A	3216	T491A154K035AS	0.5	4.0
	0.22	10%	A	3216	T491A224K035AS	0.5	4.0
	0.33	10%	A	3216	T491A334K035AS	0.5	4.0
+	0.47	10%	A	3216	T491A474K035AS	0.5	4.0
	0.47	10%	B	3528	T491B474K035AS	0.5	4.0
	0.68	10%	B	3528	T491B684K035AS	0.5	4.0
	1.0	10%	B	3528	T491B105K035AS	0.5	4.0
	1.5	10%	C	6032	T491C155K035AS	0.5	6.0
	2.2	10%	C	6032	T491C225K035AS	0.8	6.0
	3.3	10%	C	6032	T491C335K035AS	1.2	6.0
+	4.7	10%	C	6032	T491C475K035AS	1.7	6.0
	4.7	10%	D	7343	T491D475K035AS	1.7	6.0
	6.8	10%	D	7343	T491D685K035AS	2.4	6.0
+	10	10%	D	7343	T491D106K035AS	3.5	6.0
+	15	10%	X	7343H	T491X156K035AS	5.3	6.0
+	22	10%	X	7343H	T491X226K035AS	7.7	6.0

Note: NACC reserves the right to offer higher rated voltage substitutes within the same case size. The marking will indicate the higher voltage.

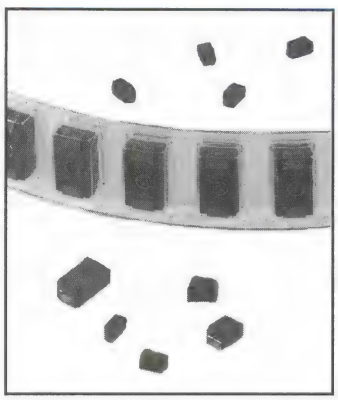
	Cap (µF)	* Cap Tol	Case Code M	Case Code EIA/IECQ	Catalog Number	DC Leakage µA @+25°C Max	DF % @ +25°C 120 Hz Max
	50 WVDC @ +85°C (33 WVDC @ +125°C)						
	0.10	10%	A	3216	T491A104K050AS	0.5	4.0
+	0.15	10%	A	3216	T491A154K050AS	0.5	4.0
	0.15	10%	B	3528	T491B154K050AS	0.5	4.0
	0.22	10%	B	3528	T491B224K050AS	0.5	4.0
	0.33	10%	B	3528	T491B334K050AS	0.5	4.0
+	0.47	10%	B	3526	T491B474K050AS	0.5	4.0
	0.47	10%	C	6032	T491C474K050AS	0.5	4.0
	0.68	10%	C	6032	T491C684K050AS	0.5	4.0
	1.0	10%	C	6032	T491C105K050AS	0.5	4.0
+	1.5	10%	C	6032	T491C155K050AS	0.5	6.0
	1.5	10%	D	7343	T491D155K050AS	0.8	6.0
	2.2	10%	D	7343	T491D225K050AS	1.1	6.0
	3.3	10%	D	7343	T491D335K050AS	1.7	6.0
+	4.7	10%	D	7343	T491D475K050AS	2.4	6.0
+	6.8	10%	X	7343H	T491X685K050AS	3.5	6.0

* - ± 20% Tolerance Available by Special Order
\+ - Extended Values
\# - Max Capacitance Change @ 125°C = +15% (All others are +12%)

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type T495 - Chips
Solid Tantalum Capacitors

MALLORY



- Designed for Very Low ESR
- High Ripple Current Capability
- High Surge Current Capability
- 100% Accelerated Steady-State Aging
- 100% In-Line Multi-Cycle Surge Current Conditioning
- Low Equivalent Series Inductance (<2.5 nH ESL)
- New Extended Values for Low ESR
- Precision-Molded, Laser-Marked Case
- Symmetrical, Compliant Terminations
- Taped and Reeled per EIA 481-1

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
(with proper derating)

Voltage Range:
6 to 50 VDC

Capacitance Range:
4.7 μF to 470 μF

Cap Change From Initial Limit
-10% @ -55°C; +10% @ +85°C
+12% @ +125°C

DC Leakage:
At 25°C -See P/N List
At 85°C - 10 x 25°C Limit
At 125°C - 12 x 25°C Limit

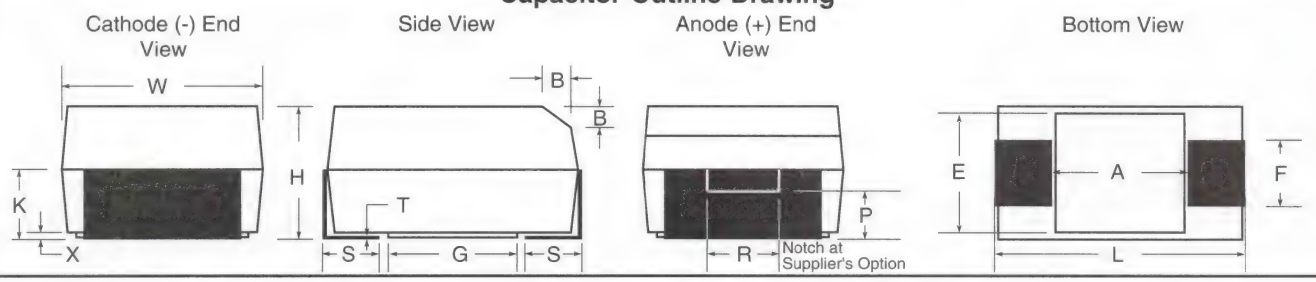
Dissipation Factor:
.1 μF to 1.0 μF — 4%
1.5 μF to 68 μF — 6%
100 μF to 220 μF — 8%

Standard Packaging
Tape & Reel per EIA RS-481-1

Case Code		Qty per 7" Reel	Tape	
	EIA/IECQ		Width	Pitch
D	7343	500	12mm	8mm
X	7343H	500	12mm	8mm
V	7343L	2,500	8mm	4mm

13" Reels Available on Special Order

Capacitor Outline Drawing



Case Code		Dimensions - Millimeters (Inches)													
NACC	EIA/IECQ	L	W	H	K	F	S	B (Ref)	X (Ref)	P (Ref)	R (Ref)	T (Ref)	A (Min)	G (Ref)	E (Ref)
D	7343	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	2.8 ± 0.3 (.110 ± .012)	1.5 ± 0.2 (.059 ± .008)	2.4 ± 0.1 (.094 ± .004)	1.3 ± 0.3 (.051 ± .012)	0.5 ± 0.15 (.020 ± .006)	0.10 ± 0.10 (.004 ± .004)	0.9 (.035)	1.0 (.039)	0.13 (.005)	3.8 (.150)	3.5 (.138)	3.5 (.138)
X	7343H	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	4.0 ± 0.3 (.157 ± .012)	2.3 ± 0.2 (.091 ± .008)	2.4 ± 0.1 (.094 ± .004)	1.3 ± 0.3 (.051 ± .012)	0.5 ± 0.15 (.020 ± .006)	0.10 ± 0.10 (.004 ± .004)	1.7 (.067)	1.0 (.039)	0.13 (.005)	3.8 (.150)	3.5** (.138)	3.5** (.138)

Notes: 1 Metric dimensions govern
2 (Ref) - Dimensions provided for reference only
** Round Glue Pad 2.9 ±0.1mm (.114 ±.004) in diameter at Supplier's option

Low Profile Capacitors

Case Code		Dimensions - Millimeters (Inches)										
NACC	EIA/IECQ	L	W	H Max.	K Min.	F± 0.1	S± 0.3	X (Ref)	T (Ref)	A (Min)	G (Ref)	E (Ref)
V	7343L	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	2.0 (.079)	1.1 (.043)	2.4 (.094)	1.3 (.051)	0.05 (.002)	0.13 (.005)	3.8 (.150)	3.5 (.138)	3.5 (.138)

Notes: 1 Metric dimensions govern
2 (Ref) - Dimensions provided for reference only
3 No dimensions provided for B, P or R because low profile cases do not have a bevel or notch

Part Number Nomenclature

T495	X	105	K	035	A	S
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. T495 Series - Precision Molded Case - Low ESR
2. Case Size Code:
   D, X, V
3. Capacitance Code (Expressed in Picofarads)
   First 2 digits: Significant Figures
   Third digit: Number of zeros (Example: 395 = 3.9 μF)
4. Capacitance Tolerance:
   K = ±10%, (M = ±20%, special order only)
5. DC Voltage Rating:
   Zeros are used to precede the voltage rating where necessary to complete the three digit block
6. Failure Rate: A = Not applicable
7. Lead Material
   S = Standard Solder Coated
   G = Gold Plated

Type T495 - Chips
Solid Tantalum Capacitors

MALLORY

6/6.3 WVDC @ +85°C (4 WVDC @ +125°C)

Cap (µF)	Cap Tol	Case Code M	Case Code EIA/IECQ	Catalog Number	DC Leakage @+25°C µA	Max DF % @ +25°C 120 Hz	Max ESR Ω @ 25°C 100 Hz	MaxRipple Current Arms@+25°C 100 kHz
68	10%	D	7343	T495D686K006AS	3.3	4.0	0.175	0.9
+ 100	10%	V	7343L	T495V107K006AS	6.0	8.0	0.150	0.9
150	10%	X	7343H	T495X157K006AS	7.2	6.0	0.100	1.3
+ 220	10%	D	7343	T495D227K006AS	13.2	8.0	0.100	1.2
+ 220	10%	X	7343H	T495X227K006AS	13.2	8.0	0.100	1.3
+ 330	10%	X	7343H	T495X337K006AS	19.8	8.0	0.100	1.3
+ 330	10%	X	7343X	T495X337K006AS*	19.8	8.0	0.065	1.6
+ 470	10%	X	7343H	T495X477K006AS	28.2	10.0	0.065	1.6
+ 470	10%	X	7343H	T495X477K006AS*	28.2	10.0	0.050	1.8

10 WVDC @ +85°C (7 WVDC @ +125°C)

Cap (µF)	Cap Tol	Case Code M	Case Code EIA/IECQ	Catalog Number	DC Leakage @+25°C µA	Max DF % @ +25°C 120 Hz	Max ESR Ω @ 25°C 100 Hz	MaxRipple Current Arms@+25°C 100 kHz
47	10%	D	7343	T495D476K010AS	3.8	4.0	0.200	0.9
68	10%	D	7343	T495D686K010AS	6.8	6.0	0.150	1.0
68	10%	X	7343H	T495X686K010AS	5.4	4.0	0.150	1.1
100	10%	D	7343	T495D107K010AS	10.0	8.0	0.100	1.2
+ 100	10%	D	7343	T495D107K010AS*	10.0	8.0	0.080	1.4
+ 100	10%	X	7343H	T495X107K010AS	8.0	6.0	0.100	1.3
+ 150	10%	D	7343	T495D157K010AS	15.0	8.0	0.100	1.2
+ 150	10%	X	7343H	T495X157K010AS	15.0	8.0	0.100	1.3
+ 220	10%	X	7343H	T495X227K010AS	22.0	8.0	0.100	1.3
+ 220	10%	X	7343H	T495X227K010AS*	22.0	8.0	0.070	1.5

16 WVDC @ +85°C (10 WVDC @ +125°C)

Cap (µF)	Cap Tol	Case Code M	Case Code EIA/IECQ	Catalog Number	DC Leakage @+25°C µA	Max DF % @ +25°C 120 Hz	Max ESR Ω @ 25°C 100 Hz	MaxRipple Current Arms@+25°C 100 kHz
33	10%	D	7343	T495D336K016AS	4.2	4.0	0.225	0.8
+ 47	10%	D	7343	T495D476K016AS	7.5	6.0	0.150	1.0
+ 100	10%	D	7343	T495D107K016AS	16.0	8.0	0.125	1.1
+ 100	10%	X	7343H	T495X107K016AS	16.0	8.0	0.100	1.3

20 WVDC @ +85°C (13 WVDC @ +125°C)

Cap (µF)	Cap Tol	Case Code M	Case Code EIA/IECQ	Catalog Number	DC Leakage @+25°C µA	Max DF % @ +25°C 120 Hz	Max ESR Ω @ 25°C 100 Hz	MaxRipple Current Arms@+25°C 100 kHz
15	10%	D	7343	T495D156K020AS	2.4	4.0	0.275	0.7
22	10%	D	7343	T495D226K020AS	3.5	4.0	0.225	0.8
+ 33	10%	D	7343	T495D336K020AS	6.6	6.0	0.200	0.9
47	10%	X	7343H	T495X476K020AS	7.5	4.0	0.150	1.0
+ 68	10%	X	7343H	T495X686K020AS	13.6	6.0	0.150	1.0

25 WVDC @ +85°C (17 WVDC @ +125°C)

Cap (µF)	Cap Tol	Case Code M	Case Code EIA/IECQ	Catalog Number	DC Leakage @+25°C µA	Max DF % @ +25°C 120 Hz	Max ESR Ω @ 25°C 100 Hz	MaxRipple Current Arms@+25°C 100 kHz
15	10%	D	7343	T495D156K025AS	3.8	6.0	0.275	0.7
15	10%	X	7343H	T495X156K025AS	3.0	4.0	0.200	0.9
+ 22	10%	D	7343	T495D226K025AS	5.5	6.0	0.200	0.9
22	10%	X	7343H	T495X226K025AS	4.4	4.0	0.225	0.9
33	10%	X	7343H	T495X336K025AS	6.6	4.0	0.175	1.0

35 WVDC @ +85°C (23 WVDC @ +125°C)

Cap (µF)	Cap Tol	Case Code M	Case Code EIA/IECQ	Catalog Number	DC Leakage @+25°C µA	Max DF % @ +25°C 120 Hz	Max ESR Ω @ 25°C 100 Hz	MaxRipple Current Arms@+25°C 100 kHz
6.8	10%	X	7343H	T495X685K035AS	1.9	4.0	0.300	0.7
10	10%	D	7343	T495D106K035AS	3.5	6.0	0.300	0.7
10	10%	X	7343H	T495X106K035AS	2.8	4.0	0.250	0.8
+ 15	10%	D	7343	T495D156K035AS	5.3	6.0	0.300	0.7
+ 15	10%	X	7343H	T495X156K035AS	5.3	6.0	0.225	0.9
+ 22	10%	X	7343H	T495X226K035AS	7.7	6.0	0.275	0.8

50 WVDC @ +85°C (33 WVDC @ +125°C)

Cap (µF)	Cap Tol	Case Code M	Case Code EIA/IECQ	Catalog Number	DC Leakage @+25°C µA	Max DF % @ +25°C 120 Hz	Max ESR Ω @ 25°C 100 Hz	MaxRipple Current Arms@+25°C 100 kHz
4.7	10%	X	7343H	T495X475K050AS	1.9	4.0	0.300	0.7

Note: NACC reserves the right to offer higher rated voltage substitutes within the same case size. The marking will indicate the higher voltage.

* - ± 20% Tolerance Available by Special Order
\+ - Extended Values
\# - Max Capacitance Change @ 125°C = +15% (All others are +12%)

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Index
Aluminum Electrolytic Capacitors

MALLORY

Type	Features	Capacitance Range	Voltage Range VDC	Temperature Range	Termination	Nominal Case Size D x L	Page Number
Large Can							
CGS	Standard High CV Computer Grade	75 μF to 1,500,000 μF	10 to 450	-40°C +85°C	Screw Terminals or PC Mount	1.375 x 2.125 3.000 x 8.625	81
CG	High Reliability Long Life	40 μF to 160,000 μF	10 to 450	-40°C +85°C	Screw Terminals or PC Mount	1.375 x 2.125 3.000 x 8.625	88
CGH	Very High Capacitance High Ripple Current	350 μF to 22,000 μF	250 to 500	-40°C +85°C	Screw Terminals	2.000 x 2.125 3.000 x 8.625	90
CGO	SMPS Output Filter Very Low ESR	2,800 μF to 45,000 μF	5 to 55	-55°C +85°C	Low Post Screw Terminals	1.375 x 2.125 1.375 x 5.625	91
CGR	High Ripple Current Long Life	330 μF to 100,000 μF	7.5 to 200	-55°C +105°C	Screw Terminals	1.375 x 3.625 3.000 x 5.625	92
HES	High Energy Discharge Capability	300 μF to 5,600 μF	350 to 450	-40°C +105°C	Screw Terminals	1.750 x 3.125 3.000 x 5.625	94
Snap Mount							
LP	High Temperature Long Life	100 μF to 47,000 μF	16 to 250	-40°C +105°C	2 Pin Terminals 10mm Lead Spacing	22mm x 25mm 35mm x 50mm	95
LPW	High Capacitance Low Voltage	820 μF to 22,000 μF	10 to 100	-40°C +85°C	2 Pin Terminals 10mm Lead Spacing	22mm x 25mm 35mm x 50mm	97
LPX	High Capacitance High Voltage	56 μF to 2,700 μF	160 to 450	-40°C +85°C	2 Pin Terminals 10mm Lead Spacing	22mm x 25mm 35mm x 50mm	99
Radial Leaded							
SK	General Purpose	0.10 μF to 22,000 μF 0.47 μF to 330 μF	6.3 to 100 160 to 450	-40°C +85°C	Radial Leads	5mm x 11mm 18mm x 42mm	102
SEK	Long Life High Reliability	0.47 μF to 15,000 μF 0.47 μF to 150 μF	6.3 to 250 350 to 450	-40°C +105°C	Radial Leads	5mm x 11mm 18mm x 42mm	107
SH	Extra Long Life Very High Reliability	0.47 μF to 15,000 μF 0.47 μF to 470 μF	6.3 to 100 160 to 350	-40°C +105°C	Radial Leads	5mm x 11mm 18mm x 42mm	112
SS	Sub-Miniature General Purpose	0.10 μF to 100 μF	6.3 to 63	-40°C +85°C	Radial Leads	4mm x 7mm 6.3mm x 7mm	116
SXR	Very Low Impedance +105°C Long Life	22 μF to 15,000 μF	6.3 to 100	-40°C +105°C	Radial Leads	8mm x 16mm 18mm x 42mm	118
SN	Non-Polar General Purpose	0.47 μF to 2,200 μF	6.3 to 100 **VNP**	-40°C +85°C	Radial Leads	5mm x 11mm 16mm x 32mm	121
VPR	Low Impedance Wide Temperature Range	34 μF to 12,000 μF	6.3 to 100	-55°C +105°C	Radial Leads	.512 x 1.024 1.000 x 3.625	125
Axial Leaded							
SKA	Miniature General Purpose	0.47 μF to 15,000 μF	6.3 to 450	-40°C +85°C	Axial Leads	6.3mm x 13mm 18mm x 43mm	128
NEW TKA	Very Low Impedance +105°C Long Life	0.47 μF to 4,700 μF	6.3 to 450	-40°C +105°C	Axial Leads	5mm x 12.5mm 22mm x 41mm	131
NEW NPA	Non-Polar Long Life	0.47 μF to 1,000 μF	16 to 100 **VNP**	-40°C +85°C	Axial Leads	6mm x 16mm 13mm x 30mm	134
TC	General Purpose	1.0 μF to 5,000 μF	16 to 450	-40°C +85°C	Axial Leads	.197 x .472 1.000 x 3.625	137
TCG	General Purpose	10 μF to 10,000 μF	10 to 450	-40°C +85°C	Axial Leads	.315 x .787 1.000 x 3.125	139
TCX	Wide Temperature Range Long Life	27 μF to 12,000 μF	10 to 150	-55°C +105°C	Axial Leads	.625 x 1.125 1.000 x 3.625	141

See pages 78 — 80 for part number formatting , outline dimensions and selector guide.

See page 258 for Capacitor Hardware.

Types CGS, CG, CGR, CGO, CGH, HES
Part Number Information

MALLORY

NACC Catalog Number: CGS 184 U ▼010 X3L *(3 P H)

TYPE:
Identifies the basic type
CGS, CG, CGR, CGO, CGH, HES

CAPACITANCE:
Expressed in microfarads
The first two digits are significant figures
The third digit is the number of zeros

CAPACITANCE TOLERANCE:
U = -10% + 75% (6.3 to 150 VDC)
T = -10% + 50% (151 to 450 VDC)
M = ±20%

▼ DC VOLTAGE RATING:
Zeros are used to precede the voltage rating where necessary to complete the three digit block
The letter 'R' indicates a decimal point

CASE CODE:
See chart on next page

INSULATING SLEEVE:
0 = No sleeve
1 = Mylar (Polyester)
3 = Blue PVC - .008" thickness (Standard)
6 = Black PVC - .008" thickness
7 = Double .008" Blue PVC (.016" total thickness)
8 = Blue PVC - .012" thickness
9 = Black PVC - .012" thickness

POLARITY:
P = Polar
N = Non Polar

TERMINAL:
H = High Post
L = Low Post
V = Printed Circuit Mount
D = Low Post, Low Resistance Screw Mount (1/4 - 28 Thread)
F = High Post Metric Thread
G = Low Post Metric Thread
N = High Post, Low Resistance Screw Mount (1/4 - 28 Thread)

NOTE: * NACC maintains a 15 digit maximum for its part numbering system.
Most parts shown in the General Catalog have PVC sleeving and are polar, with high post terminals.
The 3PH is left off the part number, but is assumed.

Type CGO has a 'L' at the end of the part number which stands for 'low post', while the case code has been omitted.
Check Standard Parts List for case size.

▼ Non-standard part numbers may require coding of the voltage to properly describe the part within the 15 digit limit.
Voltage codes are shown below.

Contact the Product Manager at NACC if help is needed to properly set up a non-standard part number.

Voltage	Code
5	A
6.3	B
7.5	C
10	D
12	E

Voltage	Code
15-16	F
20	G
25	H
28	I
30	J

Voltage	Code
35	K
40	L
45	M
50	N
55	O

Voltage	Code
60-63	P
75	Q
80	R
100	S
150	T

Voltage	Code
200	U
250	V
300	W
350	X
400	Y

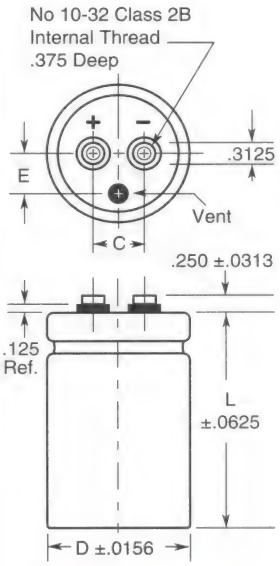
Voltage	Code
450	Z
500	ZZ

Case Code Chart

Uninsulated Can

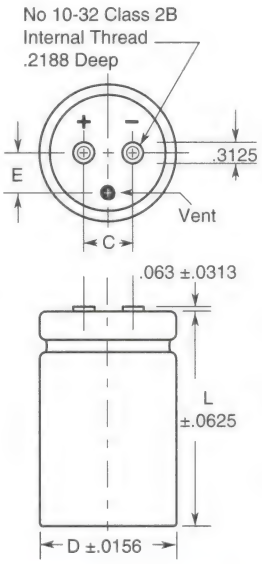
Case Code	Inches D	Inches L	mm D	mm L	Inches C	mm C	Mounting Bracket
R2C	1.375	2.125	35	54	.500	12.7	VR3
R2L	1.375	2.625	35	67	.500	12.7	VR3
R3C	1.375	3.125	35	79.4	.500	12.7	VR3
R3L	1.375	3.625	35	92	.500	12.7	VR3
R4C	1.375	4.125	35	105	.500	12.7	VR3
R4L	1.375	4.625	35	117.5	.500	12.7	VR3
R5C	1.375	5.125	35	130	.500	12.7	VR3
R5L	1.375	5.625	35	143	.500	12.7	VR3
U2C	1.750	2.125	44.5	54	.750	19	VR6
U2L	1.750	2.625	44.5	67	.750	19	VR6
U3C	1.750	3.125	44.5	79.4	.750	19	VR6
U3L	1.750	3.625	44.5	92	.750	19	VR6
U4C	1.750	4.125	44.5	105	.750	19	VR6
U4L	1.750	4.625	44.5	117.5	.750	19	VR6
U5C	1.750	5.125	44.5	130	.750	19	VR6
U5L	1.750	5.625	44.5	143	.750	19	VR6
V2C	2.000	2.125	50.8	54	.875	22.2	VR8
V2L	2.000	2.625	50.8	67	.875	22.2	VR8
V3C	2.000	3.125	50.8	79.4	.875	22.2	VR8
V3L	2.000	3.625	50.8	92	.875	22.2	VR8
V4C	2.000	4.125	50.8	105	.875	22.2	VR8
V4L	2.000	4.625	50.8	117.5	.875	22.2	VR8
V5C	2.000	5.125	50.8	130	.875	22.2	VR8
V5L	2.000	5.625	50.8	143	.875	22.2	VR8
W3C	2.500	3.125	63.5	79.4	1.125	28.6	VR10
W3L	2.500	3.625	63.5	92	1.125	28.6	VR10
W4C	2.500	4.125	63.5	105	1.125	28.6	VR10
W4L	2.500	4.625	63.5	117.5	1.125	28.6	VR10
W5C	2.500	5.125	63.5	130	1.125	28.6	VR10
W5L	2.500	5.625	63.5	143	1.125	28.6	VR10
X3L	3.000	3.625	76.2	92	1.250	31.7	VR12
X4C	3.000	4.125	76.2	105	1.250	31.7	VR12
X4L	3.000	4.625	76.2	117.5	1.250	31.7	VR12
X5C	3.000	5.125	76.2	130	1.250	31.7	VR12
X5L	3.000	5.625	76.2	143	1.250	31.7	VR12
X5R	3.000	5.875	76.2	149	1.250	31.7	VR12
X6L	3.000	6.625	76.2	168	1.250	31.7	VR12
X7L	3.000	7.625	76.2	194	1.250	31.7	VR12
X8L	3.000	8.625	76.2	219	1.250	31.7	VR12
Y3L	3.500	3.625	88.9	92	1.25	31.7	N/A
Y4C	3.500	4.125	88.9	105	1.25	31.7	N/A
Y4L	3.500	4.625	88.9	117.5	1.25	31.7	N/A
Y5C	3.500	5.125	88.9	130	1.25	31.7	N/A
Y5L	3.500	5.625	88.9	143	1.25	31.7	N/A
Y5R	3.500	5.875	88.9	149	1.25	31.7	N/A
Y6L	3.500	6.625	88.9	168	1.25	31.7	N/A
Y7L	3.500	7.625	88.9	194	1.25	31.7	N/A
Y8L	3.500	8.625	88.9	219	1.25	31.7	N/A

High Post (H) (Standard)



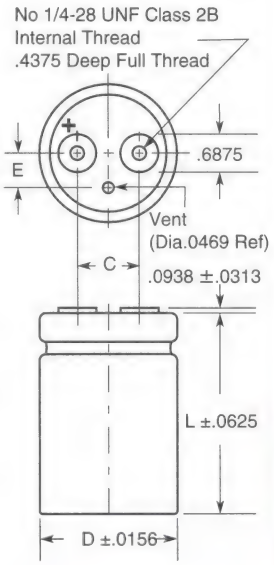
Can Dia	E
1.375	.390
1.750	.453
2.000	.500
2.500	.625
3.000	.750
3.500	.750

Low Post (L)



Can Dia	E
1.375	.390
1.750	.453
2.000	.500
2.500	.625
3.000	.750
3.500	.750

Low Resistance (D)



Can Dia	E
1.375	.390
1.750	.453
2.000	.500
2.500	.625
3.000	.750
3.500	.750

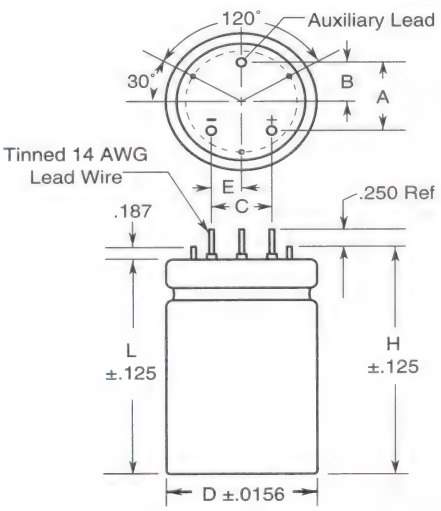
Add .015 inches to diameter and .045 inches to length for PVC insulating sleeve.

PC Mounting Board Dimensions

Uninsulated Can

Case Code	Inches D	L	H	A	B	C	E
R1N	1.375	1.750	1.937	.550	.375	.500	.250
R2C	1.375	2.125	2.312	.550	.375	.500	.250
R2L	1.375	2.625	2.812	.550	.375	.500	.250
R3C	1.375	3.125	3.312	.550	.375	.500	.250
R3L	1.375	3.625	3.812	.550	.375	.500	.250
R4C	1.375	4.125	4.312	.550	.375	.500	.250
R4L	1.375	4.625	4.812	.550	.375	.500	.250
R5C	1.375	5.125	5.312	.550	.375	.500	.250
R5L	1.375	5.625	5.812	.550	.375	.500	.250
V2C	2.000	2.125	2.312	1.000	.575	.800	.400
V2L	2.000	2.625	2.812	1.000	.575	.800	.400
V3C	2.000	3.125	3.312	1.000	.575	.800	.400
V3L	2.000	3.625	3.812	1.000	.575	.800	.400
V4C	2.000	4.125	4.312	1.000	.575	.800	.400
V4L	2.000	4.625	4.812	1.000	.575	.800	.400
V5C	2.000	5.125	5.312	1.000	.575	.800	.400
V5L	2.000	5.625	5.812	1.000	.575	.800	.400

Printed Circuit Board (V)



Type	Temperature Range	VDC Range	Life Test Hours @°C	High Cap	Low ESR	Low Hi-Freq. Imped.	High Ripple	Long Life	Low Cost	Comment
CGS / CGH	-40°C to +85°C	10 to 500	1000 +85	Good	Good	Good	Good		Best	Max Cap, Best Value Standard Life & Ripple
CG	-40°C to +85°C	10 to 450	2000 +85	Best		Good	Good		Good	Max Cap, Long Life Max Ripple, Low ESR
HES	-40°C to +105°C	350 to 400	1000 +105	Good	Good	Good	Good	Good	Good	Motor Control, Ultra High Ripple High Voltage
CGR	-40°C to +105°C	7.5 to 200	2000 +105	Good	Good	Good	Good	Good	Good	Wide Temperature Range, MIL-C-39018/04, 06, 10 equivalent
CGO	-40°C to +85°C	5 to 55	1000 +85		Best				Good	Lowest ESR

Storage: From -55°C to maximum operating temperature up to 200,000 feet above sea level.

Test Conditions

Surge Test: Connect capacitor in series with resistor as follows:
C = 0 - 2500μF R = 1000Ω
C = 2500 - 25kμF R = 500Ω
C = ≥25,001μF R = 100Ω
Subject the series combination to rated surge voltage. For capacitors rated at +85°C, apply surge voltage for 30 seconds. Allow capacitor to discharge through resistor. Apply voltage again after 9.5 minutes. Repeat 10 minute cycle for 24 hours. For capacitors rated at +105°C, apply voltage for 30 seconds and off for 5.5 minutes for 1,000 cycles. Following surge test, allow capacitors to cool to room temperature and measure DCL. DCL is not to increase from initial requirement and no electrolyte shall have leaked.

Load Life Test: Use a circulating air oven set to capacitor(s) maximum operating temperature. Seperate capacitors to maintain temperature -0°C +3°C. Apply rated VDC for rated life ±12 hours using regulated power supply free from turn-on / turn-off voltage transients. At end of test, return capacitors to room temperature for 24 hours (minimum).

DCL is not to exceed initial requirement.
Capacitance must not be less than 85% of initial measured value.
ESR must not be greater than:

Type	% of Initial Requirement
CGS / CGH	175
CG / HES	175
CGR	100
CGO	175

Full Ripple Life Test: Use a circulating air oven as in Load Life Test. Apply DC voltage with rated ripple current from AC source and reduce DC voltage unit sum of DC voltage and peak AC voltage equals capacitor's rated voltage. At end of life test return capacitors to room temperature for 24 hours (minimum). Capacitance, ESR and DCL must meet Load Life Test requirements.

Shelf Life Test: Use a circulating air oven as above for rated shelf life ±6 hours. Allow capacitors to cool to room temperature and stabilize for a minimum of 16 hours. Capacitance, ESR and DCL will meet initial requirements.

Vibration: Clamp capacitor to a vibrating platform and subject it to a simple harmonic motion with a maximum peak-to-peak amplitude of 0.06" and maximum acceleration of 10g. Vary the frequency linearly between 10 and 55Hz. Entire range of 10-55Hz must be traversed in one minute. Vibrate capacitor for 1-1/2 hours with the direction of motion being parallel to the axis of the capacitor. Then move the capacitor so the direction of motion is perpendicular to the axis of the capacitor and continue the vibration for an additional 1-1/2 hours. During the last 30 minutes of the test connect the capacitor to a bridge and observe for 3 minutes. There will be no evidence of loosening of the capacitor element within the case when shaken by hand following the test. No indication of intermittent contact, open or shorting is allowed during the 3 minute observation period.

Container Seal: Following the vibration test, each capacitor for seal tightness as follows:
Subject the capacitors to two successive temperature cycles in circulating air. One temperature cycle is:
A. 85°C for 30 minutes
B. 25°C for 30 minutes
C. -40°C for 30 minutes
D. 25°C for 30 minutes
Following the second cycle, immerse the capacitor in 90-95°C water for five minutes. A failure is a continuous chain of bubbles when immersed.

Vent Test: Apply reverse DC voltage to a capacitor at 15-25 Amperes. If the capacitor is open or shorts and the vent has not operated, test additional capacitors. The vent must operate and there must be no explosion.

Shelf Life: Capacitors stored more than 5 years should be checked for DCL to see if they meet requirements. Apply rated VDC for 30 minutes through a 1000Ω resistor to bring DCL within limits.

Voltage Reversal: Capacitors will withstand a maximum 1.5 VDC reverse bias.

Mounting: The preferred mounting for large computer grade capacitors is in the vertical position with the pressure relief vent up or horizontal with the pressure relief valve up. Be sure to allow 1/2 inch (minimum) clearance to permit the vent to operate.

Type CGS
Computer Grade Capacitors

MALLORY

- High CV Product
- Screw Terminals
- Suitable for use in most demanding applications requiring high current filtering or energy storage
- Custom Designs Available Upon Request

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
6.3 WVDC to 500 WVDC

Capacitance Range:
75μF to 1,500,000μF

Capacitance Tolerance:
-10% +75% (6.3-150 WVDC)
-10% +50% (200-450 WVDC)

DC Leakage Current:
$I = .006\sqrt{CV}$ after 30 minutes
Not to exceed 6mA
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in mA

QA Stability Test:
Apply WVDC for 1,000 hrs at 85°C

- Capacitance change ≤10% from initial limits
- DC leakage current meets initial limits
- ESR ≤ 175% of initial measured value

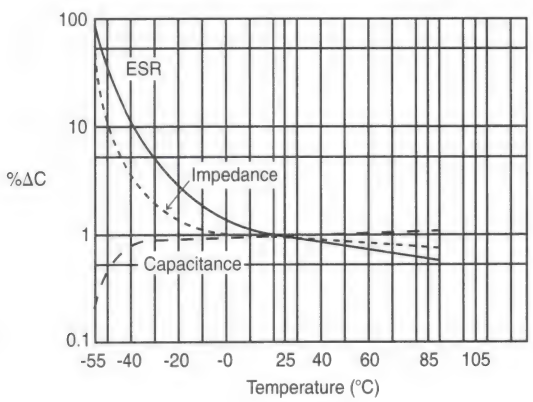
The maximum ripple current at 85°C and 120 Hz for CGS capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables:

Rated WVDC	Ripple Multipliers				
	60 Hz	120 Hz	400 Hz	1000Hz	2500KHz
3 to 50	0.8	1.0	1.05	1.10	1.14
51 to 150	0.8	1.0	1.08	1.13	1.16
151 & Up	0.8	1.0	1.15	1.21	1.25

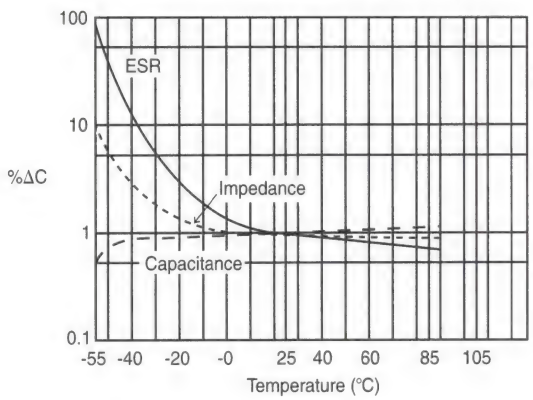
Ambient Temperature	Ripple Multiplier
+85°C	1.00
+75°C	1.4
+65°C	1.7
+55°C	2.0
+45°C	2.2

Typical Performance

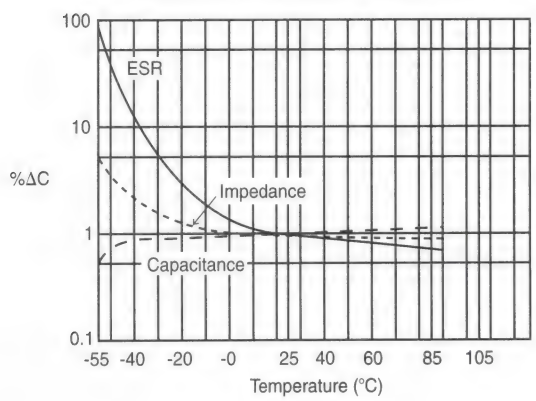
Temperature Characteristics - 100,000μF 10VDC



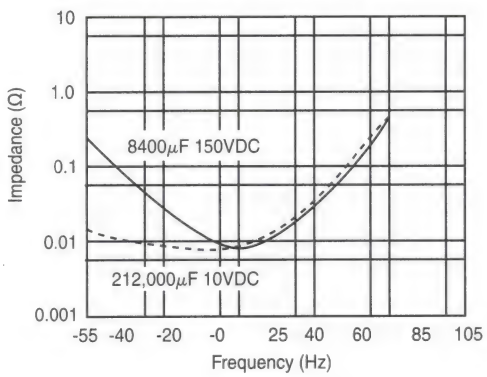
Temperature Characteristics - 29,000μF 50VDC



Temperature Characteristics - 4600μF 100VDC



Impedance vs. Frequency @ +25°C



Aluminum Capacitors

Type CGS
Computer Grade Capacitors

MALLORY

6.3 WVDC; 8 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
73,000	0.023	8.0	1.375	1.625	CGS733U6R3R2L
95,000	0.014	10.4	1.375	3.125	CGS953U6R3R3C
140,000	0.011	11.2	1.375	4.125	CGS144U6R3R4C
190,000	0.013	12.6	2.000	3.125	CGS194U6R3V3C
210,000	0.011	10.9	1.375	5.625	CGS214U6R3R5L
230,000	0.009	13.1	1.750	4.125	CGS234U6R3U4C
300,000	0.010	14.7	2.000	4.125	CGS304U6R3V4C
310,000	0.007	16.9	2.000	5.625	CGS314U6R3V5L
480,000	0.007	19.6	2.500	4.125	CGS484U6R3W4C
500,000	0.005	22.9	2.500	5.625	CGS504U6R3W5L
670,000	0.006	20.7	3.000	4.125	CGS674U6R3X4C
900,000	0.005	23.5	3.000	5.125	CGS904U6R3X5C
1,000,000	0.005	24.5	3.000	5.625	CGS105U6R3X5L
1,100,000	0.004	24.7	3.000	5.875	CGS115U6R3X5R

7.5 WVDC; 9 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
49,000	0.030	6.7	1.375	2.125	CGS493U7R5R2C
71,000	0.023	7.9	1.375	2.625	CGS713U7R5R2L
92,000	0.019	8.8	1.375	3.125	CGS923U7R5R3C
140,000	0.014	10.3	1.375	4.125	CGS144U7R5R4C
190,000	0.013	12.5	2.000	3.125	CGS194U7R5V3C
200,000	0.012	10.8	1.375	5.625	CGS204U7R5R5L
220,000	0.010	13.1	1.750	4.125	CGS224U7R5U4C
290,000	0.010	14.6	2.000	4.125	CGS294U7R5V4C
440,000	0.007	16.8	2.000	5.625	CGS444U7R5V5L
470,000	0.007	19.5	2.500	4.125	CGS474U7R5W4C
650,000	0.005	24.4	3.000	4.125	CGS654U7R5W5L
710,000	0.005	22.8	2.500	5.625	CGS714U7R5W5L
870,000	0.005	23.4	3.000	5.125	CGS874U7R5X5C
980,000	0.005	24.4	3.000	5.625	CGS984U7R5X5L
1,000,000	0.004	24.7	3.000	5.875	CGS105U7R5X5R

10 WVDC; 12 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
7,200	0.035	4.5	1.375	2.125	CGS722U010R2C
12,000	0.034	4.6	1.375	2.125	CGS123U010R2C
14,000	0.030	4.9	1.375	2.125	CGS143U010R2C
18,000	0.078	3.1	1.375	2.125	CGS183U010R2C
20,000	0.025	5.9	1.375	2.625	CGS203U010R2L
26,000	0.020	7.0	1.375	3.125	CGS263U010R3C
33,000	0.018	7.4	1.375	3.125	CGS333U010R3C
43,000	0.030	6.7	1.375	2.125	CGS433U010R2C
44,000	0.013	9.4	2.000	2.125	CGS443U010V2C
62,000	0.023	7.9	1.375	2.625	CGS623U010R2L
81,000	0.019	8.8	1.375	3.125	CGS813U010R3C
94,000	0.007	16.3	2.000	4.125	CGS943U010V4C
110,000	0.008	16.7	2.500	3.625	CGS114U010W3L
120,000	0.014	10.3	1.375	4.125	CGS124U010R4C
170,000	0.013	12.5	2.000	3.125	CGS174U010V3C
180,000	0.012	10.8	1.375	3.625	CGS184U010R5L
200,000	0.010	13.1	1.750	4.125	CGS204U010U4C
250,000	0.010	14.6	2.000	4.125	CGS254U010V4C
390,000	0.007	16.8	2.000	5.625	CGS394U010V5L
410,000	0.007	19.5	2.500	4.125	CGS414U010W4C
580,000	0.006	20.6	3.000	4.125	CGS584U010W5L
630,000	0.005	22.8	2.500	5.625	CGS634U010W5L
780,000	0.005	23.4	3.000	5.125	CGS784U010X5C
880,000	0.050	24.4	3.000	5.625	CGS884U010X5L
920,000	0.005	24.7	3.000	5.875	CGS924U010X5R

16 WVDC; 20 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
5,500	0.037	4.4	1.375	2.125	CGS552U016R2C
8,900	0.034	4.6	1.375	2.125	CGS892U016R2C

16 WVDC; 20 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
10,000	0.033	4.7	1.375	2.125	CGS103U016R2C
10,000	0.024	6.4	1.375	3.125	CGS103U016R3C
12,000	0.031	4.8	1.375	2.125	CGS123U016R2C
15,000	0.026	5.6	1.375	2.625	CGS153U016R2L
15,000	0.061	4.5	1.375	4.125	CGS153U016R4C
17,000	0.022	6.7	1.375	3.125	CGS173U016R3C
19,000	0.021	6.8	1.375	3.125	CGS193U016R3C
21,000	0.037	5.5	1.375	3.625	CGS213U016R3L
22,000	0.027	7.6	2.000	3.125	CGS223U016V3C
24,000	0.032	5.6	1.375	3.125	CGS243U016R3C
25,000	0.016	8.8	1.375	4.125	CGS253U016R4C
25,000	0.031	6.1	2.000	2.125	CGS253U016V2C
33,000	0.020	7.9	1.375	4.125	CGS333U016R4C
33,000	0.028	6.5	2.000	2.125	CGS333U016V2C
34,000	0.020	9.8	1.375	4.125	CGS343U016R4C
34,000	0.016	8.8	2.000	4.125	CGS343U016V4C
35,000	0.030	6.7	1.375	2.125	CGS353U016R2C
38,000	0.019	9.4	1.375	3.125	CGS383U016R3C
38,000	0.021	8.6	2.000	3.125	CGS383U016V3C
49,000	0.023	7.9	1.375	2.625	CGS493U016R2L
50,000	0.011	11.7	2.000	3.125	CGS503U016V3C
55,000	0.018	9.6	2.000	3.625	CGS553U016R3L
55,000	0.015	10.2	1.375	3.625	CGS553U016V3L
62,000	0.019	8.8	1.375	3.125	CGS623U016R3C
66,000	0.012	11.6	1.375	4.125	CGS663U016R4C
66,000	0.017	10.8	2.000	4.125	CGS663U016V4C
68,000	0.017	9.5	2.000	3.125	CGS683U016V3C
68,000	0.008	15.2	2.000	4.125	CGS683U016V4C
77,000	0.015	11.8	2.000	4.625	CGS773U016V4L
80,000	0.009	18.9	3.000	4.125	CGS803U016X4C
83,000	0.015	12.9	2.000	5.625	CGS833U016V5L
90,000	0.014	10.3	1.375	4.125	CGS903U016R4C
91,000	0.009	14.7	2.000	4.125	CGS913U016V4C
100,000	0.007	22.5	3.000	5.125	CGS104U016X5C
110,000	0.010	16.0	2.500	4.125	CGS114U016W4C
120,000	0.007	20.1	3.000	3.625	CGS124U016V4C
130,000	0.010	12.6	1.375	5.625	CGS134U016R5L
130,000	0.011	12.5	2.000	3.125	CGS134U016V3C
130,000	0.009	17.6	2.500	4.625	CGS134U016W4L
150,000	0.007	19.3	3.000	4.125	CGS154U016X5L
160,000	0.010	13.1	1.750	4.125	CGS164U016U4C
170,000	0.004	23.5	2.000	4.125	CGS174U016V4C
180,000	0.006	24.3	3.000	4.625	CGS184U016X4L
190,000	0.007	19.5	2.000	4.125	CGS194U016V4C
210,000	0.005	29.2	3.000	5.875	CGS214U016X5R
220,000	0.005	25.2	3.000	4.125	CGS224U016X4C
260,000	0.003	29.8	2.000	5.625	CGS264U016V5L
290,000	0.005	21.1	2.000	5.625	CGS294U016V5L
310,000	0.005	22.7	2.500	4.125	CGS314U016W4C
470,000	0.004	30.4	2.500	5.625	CGS474U016W5L
620,000	0.004	32.3	3.000	5.125	CGS624U016X5C
640,000	0.002	44.9	3.000	5.625	CGS644U016X5L
640,000	0.002	30.0	3.000	5.625	CGS644UFX5L3PD
700,000	0.003	35.0	3.000	5.625	CGS704U016X5L
740,000	0.003	35.8	3.000	5.875	CGS744U016X5R
980,000	0.007	23.8	3.000	8.625	CGS984U016X8L

20 WVDC; 22 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
250,000	0.006	29.0	3.000	3.625	CGS254U020X3L
500,000	0.004	37.0	3.000	5.625	CGS505U020X5L
1,000,000	0.003	41.0	3.000	8.625	CGS105UGX8L6PD
1,000,000	0.003	41.0	3.000	8.625	CGS105UGX8L6PH
1,000,000	0.003	40.0	3.000	5.875	CGS106U020X5R
1,500,000	0.003	41.0	3.000	8.625	CGS156U020X8L

Type CGS
Computer Grade Capacitors

MALLORY

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
25 WVDC; 30 VDC Surge					
3,000	0.235	1.8	1.375	2.125	CGS302U025R2C
4,700	0.101	2.7	1.375	2.125	CGS472U025R2C
5,600	0.026	6.1	1.375	3.125	CGS562U025R3C
6,000	0.035	4.5	1.375	2.125	CGS602U025R2C
6,800	0.096	2.8	1.375	2.125	CGS682U025R2C
8,200	0.019	8.1	1.375	4.125	CGS822U025R4C
8,900	0.024	6.4	1.375	3.125	CGS892U025R3C
10,000	0.024	6.4	1.375	3.125	CGS103U025R3C
12,000	0.024	8.1	2.000	3.125	CGS123U025R3C
12,000	0.023	6.6	1.375	3.125	CGS123U025V3C
13,000	0.082	3.9	1.375	4.125	CGS133U025R4C
14,000	0.046	5.3	1.750	3.125	CGS143U025U3C
14,000	0.037	5.6	2.000	2.125	CGS143U025V2C
16,000	0.017	8.5	1.375	4.125	CGS163U025R4C
18,000	0.017	8.6	1.375	4.125	CGS183U025R4C
18,000	0.052	6.1	2.000	4.125	CGS183U025V4C
20,000	0.023	6.5	1.375	3.125	CGS203U025R3C
20,000	0.014	10.3	1.375	5.125	CGS203U025R5C
20,000	0.024	8.0	2.000	3.125	CGS203U025V3C
22,000	0.032	6.4	1.375	2.125	CGS223U025R2C
22,000	0.043	5.2	2.000	2.125	CGS223U025V2C
28,000	0.028	7.5	2.000	3.125	CGS283U025V3C
29,000	0.018	10.5	2.000	4.125	CGS293U025V4C
30,000	0.029	8.4	2.500	3.125	CGS303U025W3C
31,000	0.024	7.6	1.375	2.625	CGS313U025R2L
32,000	0.018	10.3	2.000	4.125	CGS323U025V4C
33,000	0.018	9.3	2.000	3.125	CGS333U025V3C
40,000	0.020	8.4	1.375	3.125	CGS403U025R3C
41,000	0.020	9.8	2.000	4.125	CGS413U025V4C
43,000	0.022	8.5	1.375	4.125	CGS433U025R4C
43,000	0.021	12.2	3.000	4.125	CGS433U025X4C
47,000	0.022	9.5	2.000	4.125	CGS473U025V4C
50,000	0.018	11.7	2.000	5.625	CGS503U025V5L
50,000	0.010	14.9	2.500	3.625	CGS503U025W3L
57,000	0.017	14.6	3.000	5.125	CGS573U025X5C
58,000	0.014	10.0	1.375	4.125	CGS583U025R4C
65,000	0.009	16.5	2.500	4.125	CGS653U025W4C
68,000	0.006	17.9	2.000	4.125	CGS683U025V4C
70,000	0.010	18.1	3.000	4.125	CGS703U025X4C
82,000	0.011	15.5	2.000	3.125	CGS823U025V3C
85,000	0.011	12.2	1.375	5.625	CGS853U025R5L
90,000	0.007	21.4	2.500	5.625	CGS903U025W5L
92,000	0.008	21.6	3.000	5.125	CGS923U025X5C
95,000	0.011	16.9	3.000	4.125	CGS953U025X4C
100,000	0.010	12.7	1.750	4.125	CGS104U025U4C
100,000	0.005	22.8	2.000	5.625	CGS104U025V5L
100,000	0.011	16.0	3.000	3.625	CGS104U025X3L
110,000	0.008	20.7	3.000	5.125	CGS114U025X5C
110,000	0.009	20.9	3.000	5.625	CGS114U025X5L
120,000	0.008	15.5	2.000	4.125	CGS124U025V4C
120,000	0.010	17.9	3.000	4.125	CGS124U025X4C
120,000	0.007	21.6	3.000	5.625	CGS124U050X5L
180,000	0.004	30.3	3.000	4.125	CGS184U025X4C
190,000	0.006	20.4	2.000	5.625	CGS194U025V5L
200,000	0.005	22.0	2.500	4.125	CGS204U025W4C
204,000	0.006	29.9	3.000	8.625	CGS2043U025X8L
270,000	0.003	36.6	3.000	5.625	CGS274U025X5L
270,000	0.003	30.0	3.000	5.625	CGS274UHX5L3PD
300,000	0.005	26.2	3.000	4.125	CGS304U025W5L
310,000	0.004	29.6	2.500	5.625	CGS314U025W5L
400,000	0.004	31.6	3.000	5.125	CGS404U025X5C
450,000	0.003	34.3	3.000	5.625	CGS454U025X5L
480,000	0.003	35.0	3.000	5.875	CGS484U025X5R
740,000	0.002	48.3	3.000	8.625	CGS744U025X8L

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
30 WVDC; 40 VDC Surge					
4,500	0.037	4.4	1.375	2.125	CGS452U030R2C
5,000	0.037	4.5	1.375	2.125	CGS502U030R2C
8,000	0.024	6.4	1.375	3.125	CGS802U030R3C
9,200	0.024	6.4	1.375	3.125	CGS922U030R3C
12,000	0.018	8.4	1.375	4.125	CGS123U030R4C
13,000	0.018	8.4	1.375	4.125	CGS133U030R4C
15,000	0.016	9.3	1.375	4.625	CGS153U030R4L
20,000	0.013	11.0	1.375	5.625	CGS203U030R5L
30,000	0.019	10.0	2.000	4.125	CGS303U030V4C
33,000	0.020	9.8	2.000	4.125	CGS333U030V4C
44,000	0.015	11.7	2.500	3.125	CGS443U030W3C
50,000	0.016	12.7	2.000	5.625	CGS503U030V5L
55,000	0.009	16.3	2.500	4.125	CGS553U030W4C
78,000	0.011	16.8	3.000	4.125	CGS783U030X4C
100,000	0.008	22.4	3.000	5.625	CGS104U030X5L
35 WVDC; 45 VDC Surge					
4,400	0.145	2.2	1.375	2.125	CGS442U035R2C
8,200	0.024	6.4	1.375	3.125	CGS822U035R3C
10,000	0.038	5.5	2.000	2.125	CGS103U035V2C
12,000	0.018	8.4	1.375	4.125	CGS123U035R4C
21,000	0.023	6.4	1.375	3.125	CGS213U035R3C
21,000	0.029	7.3	2.000	3.125	CGS213U035V3C
30,000	0.028	8.6	2.500	3.125	CGS303U035W3C
31,000	0.021	9.6	2.000	4.125	CGS313U035V4C
60,000	0.010	19.7	3.000	5.125	CGS603U035X5C
70,000	0.012	16.6	3.000	4.125	CGS703U035X4C
40 WVDC; 50 VDC Surge					
2,200	0.044	4.1	1.375	2.125	CGS222U040R2C
2,700	0.042	4.2	1.375	2.125	CGS272U040R2C
3,500	0.038	4.4	1.375	2.125	CGS352U040R2C
4,200	0.028	6.0	1.375	3.125	CGS422U040R3C
4,700	0.036	4.5	1.375	2.125	CGS472U040R2C
5,100	0.026	6.1	1.370	3.125	CGS512U040R3C
6,000	0.025	6.2	1.375	3.125	CGS602U040R3C
6,200	0.020	7.9	1.375	4.125	CGS622U040R4C
7,500	0.019	8.1	1.375	4.125	CGS752U040R4C
9,000	0.019	8.2	1.375	4.125	CGS902U040R4C
9,300	0.024	8.1	2.000	3.125	CGS932U040V3C
11,000	0.024	8.0	2.000	3.125	CGS113U040V3C
12,000	0.049	5.0	1.375	4.125	CGS123U040R4C
12,000	0.067	4.2	2.000	2.125	CGS123U040V2C
13,000	0.033	6.0	1.375	2.125	CGS133U040R2C
13,000	0.017	10.5	2.000	4.125	CGS133U040V4C
17,000	0.025	6.1	1.375	3.125	CGS173U040R3C
17,000	0.029	7.4	2.000	3.125	CGS173U040V3C
17,000	0.018	10.4	2.000	4.125	CGS173U040V4C
18,000	0.025	7.1	1.375	2.625	CGS183U040R2L
20,000	0.014	13.6	2.000	5.625	CGS203U040V5L
22,000	0.031	7.1	2.000	3.125	CGS223U040V3C
23,000	0.021	7.9	1.375	3.125	CGS233U040R3C
23,000	0.020	9.9	2.000	4.125	CGS233U040V4C
32,000	0.021	9.5	2.000	4.125	CGS323U040V4C
33,000	0.021	9.7	2.000	4.125	CGS333U040V4C
34,000	0.015	9.4	1.375	4.125	CGS343U040R4C
35,000	0.015	12.8	2.000	5.625	CGS353U040V5L
40,000	0.014	9.9	2.000	3.125	CGS403U040V3C
40,000	0.010	16.3	2.500	4.125	CGS403U040W4C
40,000	0.010	18.1	3.000	4.125	CGS403U040X4C
43,000	0.020	13.8	3.000	5.125	CGS433U040X5C
47,000	0.014	11.0	2.000	3.125	CGS473U040V3C
47,000	0.010	15.8	2.500	4.125	CGS473U040W4C

Type CGS
Computer Grade Capacitors

MALLORY

40 WVDC; 50 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
49,000	0.013	11.0	1.375	5.625	CGS493U040R5L
53,000	0.008	21.5	3.000	5.125	CGS533U040X5C
55,000	0.011	16.9	2.500	5.625	CGS553U040W5L
61,000	0.011	11.4	1.750	4.125	CGS613U040U4C
68,000	0.012	16.0	3.000	4.125	CGS683U040X4C
71,000	0.010	14.0	2.000	4.125	CGS713U040V4C
78,000	0.009	22.7	3.000	6.625	CGS783U040X6L
110,000	0.007	18.6	2.000	5.625	CGS114U040V5L
120,000	0.006	20.0	2.500	4.125	CGS124U040W4C
150,000	0.003	36.6	3.000	5.625	CGS154U040X5L
150,000	0.003	30.0	3.000	5.625	CGS154ULX5L3PD
180,000	0.005	27.0	2.500	5.625	CGS184U040W5L
230,000	0.004	29.5	3.000	5.125	CGS234U040X5C
260,000	0.004	32.1	3.000	5.625	CGS264U040X5L
280,000	0.004	32.7	3.000	5.875	CGS284U040X5R
430,000	0.003	45.6	3.000	8.625	CGS434U040X8L

50 WVDC; 65 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
1,600	0.048	3.9	1.375	2.125	CGS162U050R2C
2,200	0.044	4.1	1.375	2.125	CGS222U050R2C
2,900	0.030	5.7	1.375	3.125	CGS292U050R3C
3,000	0.040	4.3	1.375	2.125	CGS302U050R2C
3,300	0.182	2.0	1.375	2.125	CGS332U050R2C
4,100	0.022	7.6	1.375	3.125	CGS412U050R3C
4,300	0.022	7.6	1.375	4.125	CGS432U050R4C
4,900	0.023	7.0	1.375	3.625	CGS492U050R3L
5,000	0.026	6.1	1.375	3.125	CGS502U050R3C
5,700	0.096	3.2	1.375	3.125	CGS572U050R3C
6,100	0.020	7.9	1.375	4.125	CGS612U050R4C
6,500	0.025	7.9	2.000	3.125	CGS652U050V3C
6,700	0.022	7.2	1.375	3.625	CGS672U050R3L
6,800	0.024	6.4	1.375	3.125	CGS682U050R3C
7,500	0.019	8.1	1.375	4.125	CGS752U050R4C
8,000	0.043	5.2	2.000	2.125	CGS802U050V2C
9,600	0.036	5.6	1.375	2.125	CGS962U050R2C
9,600	0.018	10.3	2.000	4.125	CGS962U050V4C
10,000	0.017	8.5	1.375	4.125	CGS103U050R4C
10,000	0.049	4.9	2.000	2.125	CGS103U050V2C
12,000	0.014	10.7	1.375	5.625	CGS123U050R5L
13,000	0.027	6.7	1.375	2.625	CGS133U050R2L
13,000	0.031	6.2	1.375	3.125	CGS133U050R3C
13,000	0.029	7.3	2.000	3.125	CGS133U050V3C
14,000	0.031	7.1	2.000	5.625	CGS143U050V5L
14,500	0.022	7.3	2.000	3.125	CGS1452U50V3C
15,000	0.019	10.0	2.000	4.125	CGS153U050V4C
17,000	0.022	7.5	1.375	3.125	CGS173U050R3C
18,000	0.034	6.8	2.000	3.125	CGS183U050V3C
20,000	0.019	8.2	1.375	4.125	CGS203U050R4C
20,000	0.021	9.5	2.000	4.125	CGS203U050V4C
20,000	0.014	13.2	2.000	5.625	CGS203U050V5L
24,000	0.014	12.1	2.500	3.125	CGS243U050W3C
25,000	0.016	8.9	1.375	4.125	CGS253U050R4C
25,000	0.021	9.8	1.750	4.125	CGS253U050U4C
25,000	0.024	10.2	2.500	4.125	CGS253U050W4C
27,000	0.022	9.3	2.000	4.125	CGS273U050V4C
28,000	0.018	11.4	2.000	5.125	CGS283U050V5C
30,000	0.016	12.4	2.000	5.625	CGS303U050V5L
31,000	0.028	9.6	2.500	4.125	CGS313U050W4C
33,000	0.025	10.0	2.500	4.125	CGS333U050W4C
35,000	0.016	10.5	2.000	3.125	CGS353U050V3C
37,000	0.012	11.8	1.375	5.625	CGS373U050R5L
41,000	0.009	19.2	3.000	4.625	CGS413U050X4L
43,000	0.023	12.7	3.000	5.125	CGS433U050X5C
45,000	0.012	11.0	1.750	4.125	CGS453U050U4C

50 WVDC; 65 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
48,000	0.012	16.2	3.000	4.125	CGS483U050X4C
50,000	0.008	20.4	2.500	5.625	CGS503U050W5L
51,000	0.010	18.4	3.000	5.875	CGS513U050X5R
53,000	0.011	13.3	2.000	4.125	CGS533U050V4C
56,000	0.005	23.1	3.000	3.625	CGS563U050X3L
60,000	0.010	19.8	3.000	5.125	CGS603U050X5C
68,000	0.017	15.0	3.000	4.125	CGS683U050X4C
70,000	0.016	15.7	3.000	5.625	CGS703U050X5L
79,000	0.008	17.7	2.000	5.625	CGS793U050V5L
82,000	0.004	29.2	3.000	4.125	CGS823U050X4C
87,000	0.007	19.1	2.500	4.125	CGS873U050W4C
100,000	0.007	29.3	3.000	8.625	CGS104U050X8L
120,000	0.003	36.6	3.000	5.625	CGS124U050X5L
120,000	0.003	30.0	3.000	5.625	CGS124UNX5L3PD
130,000	0.005	25.8	2.500	5.625	CGS134U050W5L
190,000	0.004	31.0	3.000	5.625	CGS194U050X5L
210,000	0.004	31.6	3.000	5.875	CGS214U050X5R
320,000	0.006	30.7	3.000	8.625	CGS324U050X8L

63 WVDC; 75 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
6,100	0.043	5.0	1.375	2.125	CGS612U063R2C
8,900	0.032	6.0	1.375	2.625	CGS892U063R2L
12,000	0.027	6.7	1.375	3.125	CGS123U063R3C
14,000	0.019	8.1	1.375	4.125	CGS143U063R4C
19,000	0.021	9.2	2.000	3.125	CGS193U063V3C
20,000	0.015	9.3	1.375	5.625	CGS203U063R5L
28,000	0.014	10.3	1.750	4.125	CGS283U063U4C
36,000	0.014	11.5	2.000	4.125	CGS363U063V4C
55,000	0.010	14.6	2.000	5.625	CGS553U063V5L
60,000	0.010	15.6	2.500	4.125	CGS603U063W4C
89,000	0.010	18.0	3.000	4.125	CGS893U063W5L
91,000	0.007	20.0	2.500	5.625	CGS913U063W5L
120,000	0.007	21.3	3.000	5.125	CGS124U063X5C
140,000	0.007	23.2	3.000	5.625	CGS144U063X5L
150,000	0.007	23.7	3.000	5.875	CGS154U063X5R
210,000	0.012	21.3	3.000	8.625	CGS214U063X8L

75 WVDC; 95 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
820	0.591	1.1	1.375	2.125	CGS821U075R2C
1,500	0.041	4.9	1.375	3.125	CGS152U075R3C
2,100	0.036	5.3	1.375	3.125	CGS212U075R3C
2,200	0.041	4.2	1.375	2.125	CGS222U075R2C
2,300	0.028	6.6	1.375	4.125	CGS232U075R4C
2,500	0.096	3.2	1.375	4.125	CGS252U075R4C
2,900	0.032	5.6	1.375	3.125	CGS292U075R3C
3,300	0.120	2.9	1.375	3.125	CGS332U075R3C
4,200	0.023	7.4	1.375	4.125	CGS422U075R4C
4,800	0.031	6.7	1.375	3.125	CGS482U075R3C
4,800	0.030	7.2	2.000	3.125	CGS482U075V3C
5,000	0.058	4.4	1.375	2.125	CGS502U075R2C
5,600	0.021	7.8	1.375	4.125	CGS562U075R4C
6,300	0.017	9.8	1.375	5.625	CGS632U075R5L
7,000	0.044	5.3	1.375	2.625	CGS702U075R2L
7,100	0.022	9.5	2.000	4.125	CGS712U075V4C
7,300	0.078	4.5	2.000	3.125	CGS732U075V3C
7,500	0.017	12.3	2.000	5.625	CGS752U075V5L
9,000	0.036	5.9	1.375	3.125	CGS902U075R3C
10,000	0.029	5.8	1.375	3.125	CGS103U075R3C
10,000	0.041	6.2	2.000	3.125	CGS103U075V3C
10,000	0.024	9.0	2.000	4.125	CGS103U075V4C
12,000	0.021	7.6	1.375	4.125	CGS123U075R4C
12,000	0.026	8.7	2.000	4.125	CGS123U075V4C
13,000	0.026	7.2	1.375	4.125	CGS133U075R4C

Type CGS
Computer Grade Capacitors

MALLORY

75 WVDC; 95 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
15,000	0.018	11.9	2.000	5.625	CGS153U075V5L
17,000	0.033	8.8	2.500	4.125	CGS173U075W4C
17,000	0.033	9.8	3.000	4.125	CGS173U075X4C
18,000	0.023	8.9	2.000	3.125	CGS183U075V3C
18,000	0.009	14.5	2.000	4.125	CGS183U075V4C
19,000	0.019	7.8	1.375	5.625	CGS193U075R5L
23,000	0.017	9.8	1.750	4.125	CGS233U075U4C
25,000	0.039	9.0	3.000	4.125	CGS253U075X4C
25,000	0.024	11.7	2.500	5.625	CGS253U075W5L
25,000	0.014	15.0	3.000	4.125	CGS253U075X4C
26,000	0.028	10.3	2.000	4.125	CGS263U075V4C
26,000	0.037	10.6	3.000	5.875	CGS263U075X5R
27,000	0.016	11.0	2.000	4.125	CGS273U075V4C
27,000	0.019	12.5	3.000	3.625	CGS273U075X3L
33,000	0.019	12.7	3.000	4.125	CGS333U075X4C
37,000	0.011	16.4	2.000	5.625	CGS373U075V5L
37,000	0.010	19.7	3.000	5.625	CGS373U075X5L
41,000	0.011	14.6	2.000	5.625	CGS413U075V5L
45,000	0.012	14.7	2.500	4.125	CGS453U075W4C
55,000	0.008	27.4	3.000	8.625	CGS553U075X8L
68,000	0.008	20.0	2.500	5.625	CGS683U075W5L
68,000	0.005	30.0	3.000	5.625	CGS683U075X5L
90,000	0.008	21.3	3.000	5.125	CGS903U075X5C
100,000	0.007	23.2	3.000	5.625	CGS104U075X5L
110,000	0.007	23.7	3.000	5.875	CGS114U075X5R
140,000	0.012	21.3	3.000	8.625	CGS144U075X8L

100 WVDC; 125 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
850	0.120	2.5	1.375	2.125	CGS851U100R2C
1,200	0.062	3.5	1.375	3.125	CGS122U100R3C
1,700	0.069	3.8	1.375	3.125	CGS172U100R3C
2,400	0.050	5.0	1.375	4.125	CGS242U100R4C
3,100	0.068	4.0	1.375	2.125	CGS312U100R2C
3,100	0.036	6.4	1.375	5.125	CGS312U100R5C
4,000	0.031	6.2	1.375	4.125	CGS402U100R4C
4,000	0.036	7.3	2.000	4.125	CGS402U100V4C
4,500	0.051	4.8	1.375	2.625	CGS452U100R2L
5,900	0.042	5.4	1.375	3.125	CGS592U100R3C
6,000	0.033	7.6	2.000	4.125	CGS602U100V4C
8,600	0.029	6.5	1.375	4.125	CGS862U100R4C
9,000	0.024	10.2	2.000	5.625	CGS902U100V5L
10,000	0.040	8.0	2.500	4.125	CGS103U100W4C
12,000	0.026	7.7	2.000	3.125	CGS123U100V3C
13,000	0.024	7.2	1.375	5.625	CGS133U100R5L
15,000	0.036	7.3	2.000	4.125	CGS153U100V4C
15,000	0.043	8.6	2.500	5.625	CGS153U100W5L
15,000	0.051	7.9	3.000	4.125	CGS153U100X4C
16,000	0.019	8.9	1.750	4.125	CGS163U100U4C
18,000	0.018	10.5	2.000	4.125	CGS183U100V4C
28,000	0.012	14.0	2.000	4.625	CGS283U100V5L
30,000	0.011	15.2	2.500	4.125	CGS303U100W4C
33,000	0.009	25.0	3.000	8.625	CGS333U100X8L
39,000	0.011	15.8	3.000	5.875	CGS393U100X5R
45,000	0.010	18.1	3.000	4.125	CGS453U100W5L
46,000	0.008	20.1	2.500	5.625	CGS463U100W5L
60,000	0.009	20.6	3.000	5.125	CGS603U100X5C
68,000	0.008	22.5	3.000	5.625	CGS683U100X5L
74,000	0.007	23.3	3.000	5.875	CGS743U100X5R
96,000	0.013	20.9	3.000	8.625	CGS963U100X8L

150 WVDC; 175 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
400	0.137	2.3	1.375	2.125	CGS401U150R2C
720	0.063	3.5	1.375	3.125	CGS721U150R3C

150 WVDC; 175 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
950	0.087	3.4	1.375	3.125	CGS951U150R3C
1,100	0.102	3.2	1.375	2.125	CGS112U150R2C
1,100	0.064	4.4	1.375	4.125	CGS112U150R4C
1,600	0.071	3.8	1.375	2.625	CGS162U150R2L
2,100	0.074	4.3	1.375	3.125	CGS212U150R3C
2,400	0.117	3.7	2.000	3.125	CGS242U150V3C
3,100	0.038	5.8	1.375	4.125	CGS312U150R4C
3,300	0.032	8.4	2.000	5.125	CGS332U150V5C
3,500	0.031	11.4	2.000	5.625	CGS352U150V5L
4,400	0.032	7.0	2.000	3.125	CGS442U150V3C
4,700	0.026	7.9	1.375	5.625	CGS472U150R5L
4,800	0.030	9.5	2.500	4.625	CGS482U150W4L
5,300	0.023	8.3	1.750	4.125	CGS532U150U4C
5,700	0.037	9.3	3.000	4.125	CGS572U150X4C
6,200	0.025	11.4	2.500	5.625	CGS622U150W5L
6,700	0.022	9.4	2.000	4.125	CGS672U150U4C
7,700	0.029	11.3	3.000	5.125	CGS772U150X5C
8,700	0.027	12.5	3.000	5.875	CGS872U150X5R
10,000	0.015	12.7	2.000	5.625	CGS103U150V5L
10,000	0.034	10.4	3.000	5.125	CGS103U150X5C
11,000	0.017	12.1	2.500	4.125	CGS113U150W4C
12,000	0.014	16.5	2.000	5.625	CGS123U150V5L
12,000	0.013	17.8	3.000	5.625	CGS123U150X5L
17,000	0.020	12.7	2.500	5.625	CGS173U150W5L
22,000	0.015	15.6	3.000	5.125	CGS223U150X5C
25,000	0.012	18.4	3.000	5.625	CGS253U150X5L
26,000	0.011	19.1	3.000	5.875	CGS263U150X5R
43,000	0.014	19.9	3.000	8.625	CGS433U150X8L

200 WVDC; 250 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
590	0.151	2.6	1.375	3.125	CGS591T200R3C
800	0.102	2.7	1.375	2.125	CGS801T200R2C
1,000	0.113	3.2	2.000	2.125	CGS102T200R4C
1,000	0.097	3.6	1.375	4.125	CGS102T200V2C
1,200	0.071	3.5	1.375	2.625	CGS122T200R2L
1,400	0.081	4.4	2.000	3.125	CGS142T200V3C
1,500	0.054	4.3	1.375	3.125	CGS152T200R3C
1,600	0.074	4.6	2.000	3.125	CGS162T200V3C
2,000	0.057	5.8	2.000	4.120	CGS202T200V4C
2,200	0.038	5.8	1.375	4.125	CGS222T200R4C
2,200	0.054	6.0	2.000	4.125	CGS222T200V4C
2,700	0.048	6.4	2.000	4.125	CGS272T200V4C
3,100	0.032	7.0	2.000	3.125	CGS312T200V3C
3,300	0.026	7.9	1.375	5.625	CGS332T200R5L
3,300	0.060	6.5	2.500	4.125	CGS332T200W4C
3,400	0.076	5.8	2.500	4.125	CGS342T200W4C
3,600	0.042	6.7	2.000	4.125	CGS362T200V4C
4,000	0.023	8.3	1.750	4.125	CGS402T200U4C
4,000	0.062	5.0	2.000	3.125	CGS402T200V3C
4,000	0.055	6.8	2.500	4.125	CGS402T200W4C
4,600	0.047	8.2	3.000	4.125	CGS462T200X4C
4,700	0.021	9.4	2.000	5.625	CGS472T200V4C
4,800	0.042	6.8	2.000	4.125	CGS482T200V4C
5,000	0.036	9.2	2.500	5.125	CGS502T200W5C
5,200	0.021	11.0	2.000	5.625	CGS522T200V5L
5,400	0.021	12.6	3.000	4.625	CGS542T200X4L
5,500	0.027	10.9	3.000	4.125	CGS552T200X4C
6,200	0.039	9.0	3.000	4.125	CGS622T200X4C
7,200	0.019	11.5	2.000	5.625	CGS722T200V5L
7,400	0.018	15.0	3.000	5.625	CGS742T200X5L
7,700	0.018	15.0	3.000	5.625	CGS772T200X5L
7,800	0.017	12.1	2.500	4.125	CGS782T200W4C
9,400	0.021	12.1	3.000	4.125	CGS942T200X4C
12,000	0.013	16.0	2.500	5.625	CGS123T200W5L

Type CGS
Computer Grade Capacitors

MALLORY

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
200 WVDC; 250 VDC Surge					
14,000	0.015	16.1	3.000	5.625	CGS143T200X5L
16,000	0.015	15.6	3.000	5.125	CGS163T200X5C
18,000	0.012	18.4	3.000	5.625	CGS183T200X5L
18,000	0.016	15.9	3.000	5.625	CGS183T200X5L
19,000	0.011	19.1	3.000	5.875	CGS193T200X5R
25,000	0.015	19.9	3.000	8.625	CGS253T200X8L
30,000	0.011	22.7	3.000	8.625	CGS303T200X8L
250 WVDC; 300 VDC Surge					
200	0.241	1.7	1.375	2.125	CGS201T250R2C
250	0.278	1.6	1.375	2.125	CGS251T250R2C
470	0.439	1.5	1.375	3.125	CGS471T250R3C
550	0.098	3.6	1.375	4.125	CGS551T250R4C
620	0.137	2.3	1.375	2.125	CGS621T250R2C
720	0.110	3.4	1.375	4.125	CGS721T250R4C
900	0.095	3.0	1.375	2.625	CGS901T250R2L
1,000	0.078	4.6	1.375	5.625	CGS102T250R5L
1,200	0.073	3.7	1.375	3.125	CGS122T250R3C
1,200	0.080	4.4	2.000	3.125	CGS122T250V3C
1,700	0.050	5.0	1.375	4.125	CGS172T250R4C
1,700	0.070	4.4	2.000	2.625	CGS172T250V2L
1,700	0.057	5.8	2.000	4.125	CGS172T250V4C
1,900	0.105	4.9	2.000	5.625	CGS192T250V5L
1,900	0.078	6.6	2.500	4.125	CGS192T250W4C
2,500	0.041	7.8	2.000	5.625	CGS252T250V5L
2,600	0.035	6.9	1.375	5.625	CGS262T250R5L
2,800	0.046	6.5	2.000	4.125	CGS282T250V4C
2,900	0.041	6.5	2.000	3.625	CGS292T250V3L
2,900	0.043	8.0	2.500	4.625	CGS292T250W4L
2,900	0.050	8.0	3.000	4.125	CGS292T250X4C
3,100	0.030	7.3	1.750	4.125	CGS312T250U4C
3,700	0.027	8.4	2.000	4.125	CGS372T250V4C
4,100	0.029	8.5	2.000	4.625	CGS412T250V4L
4,100	0.021	10.7	2.000	5.625	CGS412T250V5L
4,200	0.023	11.9	2.500	5.625	CGS422T250W5L
5,600	0.019	11.3	2.000	5.625	CGS562T250V5L
6,000	0.022	10.1	2.000	5.625	CGS602T250V5L
6,000	0.022	10.6	2.500	4.125	CGS602T250W4C
6,000	0.047	9.2	3.000	5.625	CGS602T250X5L
7,200	0.023	11.7	3.000	4.125	CGS722T250X4C
7,400	0.026	10.5	3.000	3.625	CGS742T250X3L
9,000	0.016	10.4	2.500	5.625	CGS902T250W5L
9,200	0.015	14.6	2.500	5.625	CGS922T250W5L
10,000	0.020	13.0	3.000	4.625	CGS103T250X4L
10,000	0.016	15.6	3.000	5.625	CGS103T250X5L
12,000	0.017	14.6	3.000	5.125	CGS123T250X5C
13,000	0.017	14.0	3.000	5.625	CGS133T250X5L
14,000	0.013	17.3	3.000	5.625	CGS143T250X5L
15,000	0.013	17.9	3.000	5.875	CGS153T250X5R
19,000	0.016	18.8	3.000	8.625	CGS193T250X8L
22,000	0.010	23.8	3.000	8.625	CGS223T250X8L
300 WVDC; 350 VDC Surge					
430	0.228	1.8	1.375	2.125	CGS431T300R2C
620	0.158	2.3	1.375	2.625	CGS621T300R2L
810	0.122	2.9	1.375	3.125	CGS811T300R3C
1,200	0.083	3.9	1.375	4.125	CGS122T300R4C
1,500	0.107	4.9	2.500	4.125	CGS152T300W4C
1,600	0.067	4.8	2.000	3.125	CGS162T300V3C
1,800	0.057	5.4	1.375	5.625	CGS182T300R5L
2,000	0.053	5.5	1.750	4.125	CGS202T300U4C
2,500	0.044	6.6	2.000	4.125	CGS252T300V4C
3,500	0.066	7.8	3.000	5.625	CGS352T300X5L

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
300 WVDC; 350 VDC Surge					
3,800	0.030	9.0	2.000	5.625	CGS382T300V5L
4,000	0.058	8.3	3.000	5.625	CGS402T300X5L
4,100	0.027	9.6	2.500	4.125	CGS412T300W4C
6,000	0.022	15.9	3.000	8.625	CGS602T300X8L
6,200	0.029	10.6	3.000	4.125	CGS622T300W5L
6,300	0.018	13.3	2.500	5.625	CGS632T300W5L
8,300	0.022	13.1	3.000	5.125	CGS832T300X5C
9,400	0.019	14.4	3.000	5.625	CGS942T300X5L
10,000	0.018	14.9	3.000	5.875	CGS103T300X5R
15,000	0.015	19.8	3.000	8.625	CGS153T300X8L
350 WVDC; 400 VDC Surge					
130	0.683	1.0	1.375	2.125	CGS131T350R2C
250	0.478	1.4	1.375	3.125	CGS251T350R3C
330	0.297	1.6	1.375	2.125	CGS331T350R2C
380	0.318	2.0	1.375	4.125	CGS381T350R4C
480	0.206	2.0	1.375	2.625	CGS481T350R2L
620	0.158	2.5	1.375	3.125	CGS621T350R3C
650	0.212	2.7	2.000	3.125	CGS651T350V3C
800	0.170	3.4	2.000	4.125	CGS801T350V4C
920	0.108	3.4	1.375	4.125	CGS921T350R4C
1,000	0.111	3.3	1.375	4.125	CGS102T350R4C
1,000	0.145	3.0	2.000	2.625	CGS102T350V2L
1,000	0.140	3.7	2.000	4.125	CGS102T350V4C
1,300	0.085	4.3	2.000	3.125	CGS132T350V3C
1,300	0.108	4.8	2.000	5.625	CGS132T350V5L
1,400	0.074	4.7	1.375	5.625	CGS142T350R5L
1,500	0.068	4.9	1.750	4.125	CGS152T350U4C
1,500	0.123	4.5	2.500	4.125	CGS152T350W4C
1,600	0.072	5.2	2.000	4.125	CGS162T350V4C
1,900	0.056	5.9	2.000	4.125	CGS192T350V4C
2,100	0.067	5.4	3.000	4.125	CGS212T350X4C
2,200	0.063	7.2	2.500	5.625	CGS222T350W5L
2,400	0.061	5.8	2.000	4.625	CGS242T350V4L
2,400	0.040	7.9	2.000	5.625	CGS242T350V5L
2,700	0.058	6.3	2.000	3.625	CGS272T350W3L
2,900	0.037	8.0	2.000	5.625	CGS292T350V5L
3,000	0.048	9.3	3.000	5.875	CGS302T350X5R
3,200	0.039	8.0	2.500	4.125	CGS322T350W4C
3,300	0.038	8.1	2.000	5.625	CGS332T350V5L
3,300	0.044	9.5	3.000	5.625	CGS332T350X5L
3,400	0.043	9.6	3.000	5.625	CGS342T350X5L
3,800	0.042	8.1	2.500	4.625	CGS382T350W4L
4,000	0.045	8.0	3.000	3.625	CGS402T350X3L
4,200	0.035	9.4	3.000	4.125	CGS422T350X4C
4,800	0.026	11.1	2.500	5.625	CGS482T350W5L
6,300	0.025	12.7	3.000	5.625	CGS632T350X5L
6,400	0.025	12.2	3.000	5.125	CGS642T350X5C
7,200	0.022	13.3	3.000	5.625	CGS722T350X5L
7,300	0.022	11.7	3.000	5.625	CGS732T350X5L
7,900	0.020	13.9	3.000	5.875	CGS792T350X5R
10,000	0.021	16.6	3.000	8.625	CGS103T350X8L
12,000	0.017	18.4	3.000	8.625	CGS123T350X8L
400 WVDC; 450 VDC Surge					
290	0.320	1.5	1.375	2.125	CGS291T400R2C
420	0.222	2.0	1.375	2.625	CGS421T400R2L
550	0.170	2.4	1.375	3.125	CGS551T400R3C
780	0.114	4.1	2.000	4.125	CGS781T400V4C
810	0.116	3.3	1.375	4.125	CGS811T400R4C
1,100	0.091	4.1	2.000	3.125	CGS112T400V3C
1,200	0.079	4.6	1.375	5.625	CGS122T400R5L
1,300	0.073	4.7	1.750	4.125	CGS132T400U4C

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type CGS
Computer Grade Capacitors

MALLORY

400 WVDC; 450 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
1,700	0.060	5.7	2.000	4.125	CGS172T400V4C
2,600	0.040	7.8	2.000	5.625	CGS262T400V5L
2,800	0.042	7.8	2.500	4.125	CGS282T400W4C
4,200	0.035	9.6	3.000	4.125	CGS422T400W5L
4,300	0.028	10.8	2.500	5.625	CGS432T400W5L
5,700	0.026	11.9	3.000	5.125	CGS572T400X5C
6,400	0.024	13.0	3.000	5.625	CGS642T400X5L
7,000	0.022	13.5	3.000	5.875	CGS702T400X5R
11,000	0.015	19.8	3.000	8.265	CGS113T400X8L

450 WVDC; 525 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
75	0.835	0.9	1.375	2.125	CGS750T450R2C
100	0.737	1.0	1.375	2.125	CGS101T450R2C
140	0.496	1.4	1.375	3.125	CGS141T450R3C
170	0.456	1.5	1.375	3.125	CGS171T450R3C
210	0.332	1.9	1.375	4.125	CGS211T450R4C
240	0.416	1.3	1.375	2.125	CGS241T450R2C
250	0.308	2.0	1.375	4.125	CGS251T450R4C
320	0.253	2.5	2.000	3.125	CGS321T450V3C
350	0.288	1.7	1.375	2.625	CGS351T450R2L
350	0.226	3.2	1.375	5.125	CGS351T450R5C
400	0.198	2.9	1.375	5.625	CGS401T450R5L
450	0.188	2.9	2.000	3.125	CGS451T450V3C
460	0.221	2.1	1.375	3.125	CGS461T450R3C
480	0.171	3.4	2.000	4.125	CGS481T450V4C
620	0.201	2.6	2.000	2.625	CGS621T450V2L
650	0.154	3.7	2.000	4.125	CGS651T450V4C
680	0.151	2.9	1.375	4.125	CGS681T450R4C
800	0.108	4.4	2.000	4.625	CGS801T450V4L
930	0.116	3.7	2.000	3.125	CGS931T450V3C
970	0.096	4.5	2.000	4.125	CGS971T450V4C
1,000	0.103	4.0	1.375	5.625	CGS102T450R5L
1,000	0.100	4.1	2.000	3.625	CGS102T450V3L
1,000	0.082	5.5	2.500	4.125	CGS102T450W4C
1,100	0.094	4.1	1.750	4.125	CGS112T450U4C
1,100	0.076	6.5	3.000	4.125	CGS112T450X4C
1,400	0.076	5.0	2.000	4.125	CGS142T450V4C
1,400	0.069	5.5	2.000	4.625	CGS142T450V4L
1,400	0.059	6.5	2.000	5.625	CGS142T450V5L
1,400	0.060	7.1	2.500	5.125	CGS142T450W5C
1,500	0.059	7.4	3.000	4.125	CGS152T450X4C
1,500	0.057	8.1	3.000	5.125	CGS152T450X5C
1,700	0.063	6.0	2.500	3.625	CGS172T450W3L
1,800	0.054	5.4	2.000	5.625	CGS182T450V5L
1,800	0.048	9.3	3.000	5.875	CGS182T450X5R
1,900	0.052	7.6	3.000	5.625	CGS192T450X5L
2,000	0.045	9.1	3.000	5.125	CGS202T450X5C
2,200	0.051	6.9	2.000	5.625	CGS222T450V5L
2,200	0.045	8.4	3.000	4.125	CGS222T450X4C
2,300	0.052	7.0	2.500	4.125	CGS232T450W4C
2,400	0.048	7.2	2.500	4.125	CGS242T450W4C
2,400	0.055	7.1	2.500	4.625	CGS242T450W4L
2,400	0.038	10.3	3.000	5.625	CGS242T450X5L
2,500	0.058	7.0	3.000	3.625	CGS252T450X3L
3,100	0.043	7.2	2.500	5.625	CGS312T450W5L
3,300	0.031	11.4	3.000	5.625	CGS332T450X5L
3,500	0.042	8.8	3.000	4.125	CGS352T450W5L
3,600	0.035	9.7	2.500	5.625	CGS362T450W5L
3,600	0.041	9.2	3.000	4.625	CGS362T450X4L
4,600	0.032	9.6	3.000	5.625	CGS462T450X5L
4,700	0.031	10.9	3.000	5.125	CGS472T450X5C
5,300	0.028	12.0	3.000	5.625	CGS532T450X5L
5,800	0.026	12.4	3.000	5.875	CGS582T450X5R
7,700	0.020	16.7	3.000	8.625	CGS772T450X8L
9,000	0.017	18.2	3.000	8.625	CGS902T450X8L

500 WVDC; 550 VDC Surge

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
160	.610	1.1	1.375	2.125	CGS161T500R2C
240	.422	1.4	1.375	2.625	CGS241T500R2L
240	.416	1.6	1.750	2.125	CGS241T500U2C
310	.323	1.8	1.375	3.125	CGS311T500R3C
310	.322	2.0	2.000	2.125	CGS311T500V2C
361	.282	2.1	1.750	2.625	CGS361T500U2L
380	.262	2.1	1.375	3.625	CGS381T500R3L
450	.220	2.4	1.375	4.125	CGS451T500R4C
460	.225	2.6	2.000	2.625	CGS461T500V2L
530	.190	2.7	1.375	4.625	CGS531T500R4L
600	.167	3.0	1.375	5.125	CGS601T500R5C
620	.164	3.2	1.750	3.625	CGS621T500U3L
620	.165	3.2	2.000	3.125	CGS621T500V3C
670	.150	3.5	1.375	5.625	CGS671T500R5L
750	.136	3.6	1.750	4.125	CGS751T500U4C
790	.131	3.8	2.000	3.625	CGS791T500V3L
880	.116	4.1	1.750	4.625	CGS881T500U4L
950	.108	4.4	2.000	4.125	CGS951T500V4C
1000	.101	4.6	1.750	5.125	CGS102T500U5C
1000	.101	4.7	2.500	3.125	CGS102T500W3C
1100	.089	5.1	1.750	5.625	CGS112T500U5L
1100	.092	5.0	2.000	4.625	CGS112T500V4L
1300	.081	5.6	2.000	5.125	CGS132T500V5C
1300	.080	5.6	2.500	3.625	CGS132T500W3L
1500	.072	6.1	2.000	5.625	CGS152T500V5L
1600	.066	6.5	2.500	4.125	CGS162T500W4C
1800	.057	7.3	2.500	4.625	CGS182T500W4L
1900	.057	7.5	3.000	3.625	CGS192T500X3L
2100	.049	8.2	2.500	5.125	CGS212T500W5C
2300	.047	8.7	3.000	4.125	CGS232T500X4C
2400	.044	9.0	2.500	5.625	CGS242T500W5L
2700	.041	9.8	3.500	3.625	CGS272T500Y3L
2800	.040	9.8	3.000	4.625	CGS282T500X4L
3200	.035	20.3	3.000	5.125	CGS322T500X5C
3300	.034	11.2	3.500	4.125	CGS332T500Y4C
3500	.030	12.1	3.000	5.625	CGS352T500X5L
4400	.025	14.1	3.500	5.125	CGS442T500Y5C
4800	.023	15.2	3.500	5.625	CGS482T500Y5L
6000	.018	18.7	3.000	8.625	CGS602T500X8L
8300	.014	23.1	3.500	8.625	CGS832T500Y8L

Type CG
Computer Grade Capacitors

MALLORY

- High Reliability 85°C
- Screw Terminals
- Long Life
- Custom Designs Available Upon Request

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
10 WVDC to 450 WVDC

Capacitance Range:
40 μF to 160,000 μF

Capacitance Tolerance:
-10% +75% (10 - 150 WVDC)
-10% +50% (151 - 450 WVDC)

DC Leakage Current:
$I = 6 \times 10^{-6}$ CV after 30 minutes
Not to exceed 4.0mA
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in mA

QA Stability Test:
Apply WVDC for 2,000 hrs at 85°C
- Capacitance change ≤15% from initial limits
- DC leakage current meets initial limits
- ESR ≤ 175% of initial measured value

The maximum ripple current at 85°C and 120 Hz for CG capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables:

Rated WVDC	Ripple Multipliers				
	120 Hz	400 Hz	1000 Hz	2500Hz	10KHz
10 to 75	1.0	1.050	1.085	1.135	1.150
76 to 250	1.0	1.075	1.125	1.155	1.210
251 to 450	1.0	1.080	1.130	1.175	1.230

Ambient Temperature	Ripple Multiplier
+85°C	1.00
+65°C	1.42
+55°C	1.58
+45°C	1.72
+35°C	1.88
+25°C	2.00

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
10 WVDC; 15 VDC Surge					
160,000	.006	27.10	3.000	5.625	CG164U010X5L
16 WVDC; 20 VDC Surge					
2,500	.047	3.90	1.375	2.125	CG252U016R2C
6,500	.039	4.30	1.375	2.125	CG652U016R2C
10,500	.027	7.60	2.000	3.125	CG1052U016V3C
12,000	.024	6.40	1.375	3.125	CG123U016R3C
18,000	.018	8.30	1.375	4.125	CG183U016R4C
21,000	.012	10.50	1.750	3.125	CG213U016U3C
27,000	.012	11.40	2.000	3.125	CG273U016V3C
40,000	.009	14.70	2.000	4.125	CG403U016V4C
25 WVDC; 40 VDC Surge					
1,500	.058	3.50	1.375	2.125	CG152U025R2C
2,800	.036	5.20	1.375	3.125	CG282U025R3C
3,300	.043	4.10	1.375	2.125	CG332U025R2C
4,500	.006	14.80	1.750	3.125	CG452U025U3C
6,000	.029	7.30	2.000	3.125	CG602U025V3C
6,300	.028	5.90	1.375	3.125	CG632U025R3C
8,500	.022	9.40	2.000	4.125	CG852U025V4C
9,200	.022	7.50	1.375	4.125	CG922U025R4C
10,000	.026	7.10	1.750	3.125	CG103U025U3C
13,000	.024	8.00	2.000	3.125	CG133U025V3C
20,000	.019	10.10	2.000	4.125	CG203U025V4C
20,000	.019	12.90	3.000	4.125	CG203U025X4C
32,000	.010	15.90	2.500	4.125	CG323U025W4C
48,000	.005	25.20	3.000	4.125	CG483U025X4C
35 WVDC; 50 VDC Surge					
1,100	0.063	3.40	1.375	2.125	CG112U035R2C
2,100	0.039	5.00	1.375	3.125	CG212U035R3C
2,300	0.051	3.80	1.375	2.125	CG232U035R2C
4,300	0.030	5.70	1.375	3.125	CG432U035R3C
9,500	0.025	7.90	2.000	3.125	CG952U035V3C

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
35 WVDC; 50 VDC Surge					
11,000	0.021	11.00	2.500	4.125	CG113U035W4C
11,000	0.020	9.10	1.750	4.125	CG113U035U4C
14,000	0.018	10.40	2.000	4.125	CG143U035V4C
22,000	0.011	15.20	2.500	4.125	CG223U035W4C
33,000	0.006	23.00	3.000	4.125	CG333U035X4C
50 WVDC; 75 VDC Surge					
800	0.072	3.20	1.375	2.125	CG801U050R2C
1,500	0.058	3.50	1.375	2.125	CG152U050R2C
1,500	0.044	4.70	1.375	3.125	CG152U050R3C
2,000	0.033	6.10	1.375	4.125	CG202U050R4C
2,500	0.037	6.00	1.750	3.125	CG252U050U3C
2,900	0.036	5.20	1.375	3.125	CG292U050R3C
3,300	0.035	6.70	2.000	3.125	CG332U050V3C
4,300	0.026	6.90	1.375	4.125	CG432U050R4C
4,500	0.026	8.60	2.000	4.125	CG452U050V4C
5,000	0.029	6.70	1.750	3.125	CG502U050U3C
6,500	0.017	9.60	2.000	3.125	CG652U050V3C
7,300	0.023	10.50	2.500	4.125	CG732U050W4C
7,400	0.022	8.70	1.750	4.125	CG742U050U4C
9,500	0.013	12.20	2.000	4.125	CG952U050V4C
10,000	0.013	15.60	3.000	4.125	CG103U050X4C
15,000	0.009	16.80	2.500	4.125	CG153U050W4C
16,500	0.010	20.50	3.000	5.625	CG1652U050X5L
22,000	0.006	22.50	3.000	4.125	CG223U050X4C
33,000	0.005	29.00	3.000	5.625	CG333U050X5L
75 WVDC; 100 VDC Surge					
600	0.085	2.90	1.375	2.125	CG601U075R2C
800	0.072	3.20	1.375	2.125	CG801U075R2C
1,000	0.053	4.30	1.375	3.125	CG102U075R3C
1,500	0.037	5.80	1.375	4.125	CG152U075R4C
1,500	0.045	4.70	1.375	3.125	CG152U075R3C
2,000	0.039	5.80	1.750	3.125	CG202U075U3C
2,500	0.036	6.60	2.000	3.125	CG252U075V3C

Type CG
Computer Grade Capacitors

MALLORY

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
75 WVDC; 100 VDC Surge					
2,600	0.035	6.10	1.750	3.125	CG262U075U3C
3,300	0.022	8.40	2.000	3.125	CG332U075V3C
3,450	0.027	8.50	2.000	4.125	CG3451U075V4C
4,900	0.015	11.30	2.000	4.125	CG492U075V4C
7,900	0.012	14.50	2.500	4.125	CG792U075W4C
8,200	0.012	16.30	3.000	4.125	CG822U075X4C
11,000	0.009	18.80	3.000	4.125	CG113U075X4C
12,500	0.009	21.80	3.000	5.625	CG1252U075X5L
100 WVDC; 135 VDC Surge					
400	0.180	2.00	1.375	2.125	CG401U100R2C
1,000	0.068	4.30	1.375	4.125	CG102U100R4C
1,300	0.066	4.50	1.750	3.125	CG132U100U3C
1,700	0.050	5.70	1.750	4.125	CG172U100W4C
2,250	0.036	7.30	2.000	4.125	CG2251U100V4C
2,500	0.030	8.00	2.000	4.125	CG252U100V4C
3,600	0.020	11.30	2.500	4.125	CG362U100W4C
4,000	0.019	11.50	2.500	4.125	CG402U100W4C
150 WVDC; 185 VDC Surge					
275	0.170	2.10	1.375	2.125	CG2750U150R2C
500	0.103	3.10	1.375	3.125	CG501U150R3C
1,550	0.052	6.10	2.000	4.125	CG1551U150V4C
2,500	0.030	9.20	2.500	4.125	CG252U150W4C
3,600	0.022	9.40	3.000	4.125	CG362U150X4C
5,600	0.014	17.00	3.000	3.625	CG562U150X3L
200 WVDC; 250 VDC Surge					
180	0.280	1.60	1.375	2.125	CG181T200R2C
450	0.120	3.20	1.375	4.125	CG451T200R4C
550	0.150	3.00	1.750	3.125	CG551T200U3C
750	0.085	4.80	2.000	3.125	CG751T200V3C
1,000	0.050	7.10	2.000	4.125	CG102T200V4C
1,650	0.102	3.90	2.500	4.125	CG1651T200W4C
2,450	0.034	9.70	3.000	4.125	CG2451T200X4C
3,800	0.023	13.20	3.000	5.625	CG382T200X5L

Cap µF	Max ESR (ohms) @ 120Hz	Max Ripple RMS Amps @ 120Hz +85°C	Dia	Length	Catalog Number
250 WVDC; 300 VDC Surge					
140	0.310	1.50	1.375	2.125	CG141T250R2C
375	0.130	3.10	1.375	4.125	CG3750T250R4C
600	0.091	4.10	2.000	3.125	CG601T250V3C
800	0.072	4.60	2.000	4.125	CG801T250V4C
3,000	0.020	14.20	3.000	5.625	CG302T250X5L
300 WVDC; 350 VDC Surge					
525	0.095	4.00	2.000	3.125	CG5250T300V3C
350 WVDC; 400 VDC Surge					
100	0.720	1.00	1.375	2.125	CG101T350R2C
180	0.500	1.40	1.375	3.125	CG181T350R3C
250	0.290	2.10	1.375	4.125	CG251T350R4C
400	0.260	2.40	2.000	3.125	CG401T350V3C
550	0.180	3.30	2.000	4.125	CG551T350V4C
2,000	0.061	8.10	3.000	5.625	CG202T350X5L
400 WVDC; 475 VDC Surge					
325	0.220	3.00	2.000	4.125	CG3250T400V4C
450 WVDC; 525 VDC Surge					
40	3.240	0.50	1.375	2.125	CG400T450R2C
110	1.220	1.00	1.375	4.125	CG111T450R4C
240	0.330	2.40	2.000	4.125	CG241T450V4C

Type CGH
Computer Grade Capacitors

- High Ripple Current
- Very High Capacitance
- High Reliability
- Suitable for Use in Most AC Drive and UPS Applications

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
250 WVDC to 500 WVDC

Capacitance Range:
350 μF to 22,000 μF

Capacitance Tolerance:
-10% +50%

DC Leakage Current:
I = .006 $\sqrt{CV}$ after 5 minutes
Not to exceed 6mA
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in mA

QA Stability Test:
Apply WVDC for 1,000 hrs at 85°C
- Capacitance change ≤10% from initial limits
- DC leakage current meets initial limits
- ESR ≤ 175% of initial measured value

The maximum ripple current at 85°C and 120 Hz for CGH capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers				
	120Hz	400Hz	1000Hz	2500Hz	10kHz
250 to 500	1.00	1.08	1.113	1.175	1.23

Ambient Temperature	Ripple Multiplier
+85°C	1.0
+75°C	1.4
+65°C	1.7
+55°C	2.0
+45°C	2.25
+35°C	2.45

250 WVDC; 300 VDC Surge

Cap μF	Max ESR (mOHMS) 120 Hz	Max ESR (mOHMS) 20 kHz	Max Ripple RMS Amps 120 Hz	Max Ripple RMS Amps 20 kHz	Dia	Length	Catalog Number High Post
1,700	65.8	42.1	4.0	5.0	2.000	2.625	CGH172T250V2L
2,900	53.1	34.0	5.7	7.1	2.000	3.625	CGH292T250V3L
4,100	25.7	16.4	9.1	11.4	2.000	4.625	CGH412T250V4L
5,000	26.9	17.2	9.2	11.5	2.500	3.625	CGH502T250W3L
5,300	20.6	13.2	11.0	13.8	2.000	5.625	CGH532T250V5L
7,000	20.1	12.9	11.7	14.6	2.500	4.625	CGH702T250W4L
7,400	27.1	17.3	10.3	12.9	3.000	3.625	CGH742T250X3L
9,000	16.3	10.4	14.1	17.6	2.500	5.625	CGH902T250W5L
10,000	20.4	13.1	13.0	16.3	3.000	4.625	CGH103T250X4L
13,000	16.8	10.8	15.6	19.5	3.000	5.625	CGH133T250X5L
22,000	11.5	7.4	22.3	27.9	3.000	8.625	CGH223T250X8L

350 WVDC; 400 VDC Surge

Cap μF	Max ESR (mOHMS) 120 Hz	Max ESR (mOHMS) 20 kHz	Max Ripple RMS Amps 120 Hz	Max Ripple RMS Amps 20 kHz	Dia	Length	Catalog Number High Post
1,000	162.6	104.1	2.9	3.6	2.000	2.625	CGH102T350V2L
1,700	81.9	52.4	4.6	5.8	2.000	3.625	CGH172T350V3L
2,400	58.8	37.6	6.0	7.5	2.000	4.625	CGH242T350V4L
2,700	54.3	34.8	6.5	8.1	2.500	3.625	CGH272T350W3L
2,900	53.1	34.0	6.8	8.5	2.500	3.625	CGH292T350W3L
3,100	46.2	29.6	7.4	9.3	2.000	5.625	CGH312T350V5L
3,800	39.3	25.2	8.4	10.5	2.500	4.625	CGH382T350W4L
4,000	44.3	28.4	8.1	10.1	3.000	3.625	CGH402T350X3L
4,100	38.6	24.7	8.6	10.8	2.500	4.625	CGH412T350W4L
4,300	43.5	27.8	8.4	10.5	3.000	3.625	CGH432T350X3L
4,900	31.5	20.2	10.1	12.6	2.500	5.625	CGH492T350W5L
5,200	31.1	19.9	10.3	12.9	2.500	5.625	CGH522T350W5L
5,700	32.5	20.8	10.3	12.9	3.000	4.625	CGH572T350X4L
6,000	32.3	20.7	10.6	13.3	3.000	4.625	CGH602T350X4L
7,300	25.9	16.6	12.5	15.6	3.000	5.625	CGH732T350X5L
7,800	25.6	16.4	12.8	16.0	3.000	5.625	CGH782T350X5L
10,000	20.7	13.2	16.6	20.8	3.000	8.625	CGH103T350X8L

450 WVDC; 525 VDC Surge

Cap μF	Max ESR (mOHMS) 120 Hz	Max ESR (mOHMS) 20 kHz	Max Ripple RMS Amps 120 Hz	Max Ripple RMS Amps 20 kHz	Dia	Length	Catalog Number High Post
620	159.6	102.1	2.9	3.6	2.000	2.625	CGH621T450V2L
1,000	83.4	53.4	4.8	6.0	2.000	3.625	CGH102T450V3L
1,400	60.3	38.6	5.9	7.4	2.000	4.625	CGH142T450V4L
1,700	55.3	35.4	6.4	8.0	2.500	3.625	CGH172T450W3L
1,800	47.6	30.5	7.2	9.0	2.000	5.625	CGH182T450V5L
2,400	40.1	25.7	8.3	10.4	2.500	4.625	CGH242T450W4L
2,500	44.9	28.7	8.0	10.0	3.000	3.625	CGH252T450X3L
3,100	31.7	20.3	10.1	12.6	2.500	5.625	CGH312T450W5L
3,600	32.6	20.9	10.3	12.9	3.000	4.625	CGH362T450X4L
4,600	26.2	16.8	12.4	15.5	3.000	5.625	CGH462T450X5L
7,700	17.3	11.1	18.2	22.8	3.000	8.625	CGH772T450X8L

500 WVDC; 550 VDC Surge

Cap μF	Max ESR (mOHMS) 120 Hz	Max ESR (mOHMS) 20 kHz	Max Ripple RMS Amps 120 Hz	Max Ripple RMS Amps 20 kHz	Dia	Length	Catalog Number High Post
350	692.0	612.0	1.3	1.5	2.000	2.125	CGH351T500V2C
520	470.0	416.0	1.7	1.9	2.000	2.625	CGH521T500V2L
710	345.0	305.0	2.1	2.4	2.000	3.125	CGH711T500V3C
900	272.0	241.0	2.5	2.8	2.000	3.625	CGH901T500V3L
1100	225.0	199.0	3.1	3.3	2.000	4.125	CGH112T500V4C
1200	218.0	196.0	3.1	3.4	2.500	3.125	CGH122T500W3C
1300	192.0	170.0	3.3	3.7	2.000	4.625	CGH132T500V4L
1500	168.0	148.0	3.7	4.1	2.000	5.125	CGH152T500V5C
1500	172.0	153.0	3.6	4.1	2.500	3.625	CGH152T500W3L
1700	149.0	132.0	4.0	4.5	2.000	5.625	CGH172T500V5L
1800	142.0	126.0	4.2	4.7	2.500	4.125	CGH182T500W4C
2100	121.0	108.0	4.8	5.3	2.500	4.625	CGH212T500W4L
2200	124.0	111.0	4.8	5.4	3.000	3.625	CGH222T500X3L
2400	106.0	94.1	5.3	6.0	2.500	5.125	CGH242T500W5C
2700	93.9	83.5	5.9	6.6	2.500	5.625	CGH272T500W5L
2700	103.0	91.8	5.6	6.3	3.000	4.125	CGH272T500X4C
3100	87.4	78.4	6.3	7.0	3.000	4.625	CGH312T500X4L
3600	76.3	68.4	7.0	7.8	3.000	5.125	CGH362T500X5C
4100	67.8	60.8	7.7	8.6	3.000	5.625	CGH412T500X5L
6900	41.0	36.9	11.9	13.2	3.000	8.625	CGH692T500X8L

Type CGO
Computer Grade Capacitors

MALLORY

- Output Filter for SMPS Applications
- Extremely Low Symmetrically Controlled ESR
- 35 mm Diameter

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
5 WVDC to 55 WVDC

Capacitance Range:
2,800 μF to 45,000 μF

Capacitance Tolerance:
± 20%

DC Leakage Current:
I= .0015 $\sqrt{CV}$ after 5 minutes
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in mA

QA Stability Test:
Apply WVDC for 1,000 hrs at 85°C
- Capacitance change ≤15% from initial limits
- DC leakage current meets initial limits
- ESR ≤175% of initial measured value

The maximum ripple current at 85°C and 20 kHz for CGO capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables:

Rated WVDC	Ripple Multipliers				
	120 Hz	400 Hz	1000Hz	2500 kHz	10 kHz
5 to 55	.84	.85	.86	.87	.95

Ambient Temperature	Ripple Multiplier
+85°C	1.00
+75°C	1.30
+65°C	1.50
+55°C	1.72
+45°C	1.93
+35°C	2.15

Cap μF	Max ESR (ohms) @ 120Hz 25°C	Max ESR (ohms) @ 20kHz 25°C	Max Ripple RMS Amps @ 20 kHz +85°C	Dia	Length	Catalog Number
5 WVDC; 6 VDC Surge						
18000	.0166	.0099	9.8	1.375	2.125	CGO183M005L
7.5 WVDC; 9 VDC Surge						
15000	.0158	.0096	9.4	1.375	2.125	CGO153M7R5L
21000	.0131	.0083	10.9	1.375	2.625	CGO213M7R5L
27000	.0108	.0071	12.7	1.375	3.125	CGO273M7R5L
33000	.0094	.0064	14.2	1.375	3.625	CGO333M7R5L
39000	.0086	.0060	15.5	1.375	4.125	CGO393M7R5L
45000	.0076	.0052	17.5	1.375	4.625	CGO453M7R5L
10 WVDC; 12 VDC Surge						
14000	.0180	.0103	9.3	1.375	2.125	CGO143M010L
19000	.0133	.0083	10.9	1.375	2.625	CGO193M010L
16 WVDC; 18 VDC Surge						
10000	.0167	.0096	9.3	1.375	2.125	CGO103M016L
14000	.0079	.0055	10.9	1.375	2.625	CGO143M016L
18000	.0113	.0071	12.6	1.375	3.125	CGO183M016L
22000	.0098	.0064	14.2	1.375	3.625	CGO223M016L
20 WVDC; 22 VDC Surge						
12000	.0142	.0085	10.8	1.375	2.625	CGO123M020L
16000	.0115	.0072	12.6	1.375	3.125	CGO163M020L
20000	.0100	.0065	14.1	1.375	3.625	CGO203M020L
22000	.0093	.0061	15.4	1.375	4.125	CGO223M020L
27000	.0080	.0053	17.4	1.375	4.625	CGO273M020L
34000	.0071	.0049	19.6	1.375	5.625	CGO343M020L

Cap μF	Max ESR (ohms) @ 120Hz 25°C	Max ESR (ohms) @ 20kHz 25°C	Max Ripple RMS Amps @ 20 kHz +85°C	Dia	Length	Catalog Number
28 WVDC; 32 VDC Surge						
6300	.0213	.0121	8.3	1.375	2.125	CGO632M028L
8800	.0170	.0101	9.9	1.375	2.625	CGO882M028L
8900	.0165	.0100	10.1	1.375	2.625	CGO892M028L
14000	.0119	.0075	13.1	1.375	3.625	CGO143M028L
35 WVDC; 40 VDC Surge						
4500	.0235	.0124	8.2	1.375	2.125	CGO452M035L
6300	.0185	.0104	9.8	1.375	2.625	CGO632M035L
8100	.0150	.0087	11.5	1.375	3.125	CGO812M035L
10000	.0129	.0077	13.0	1.375	3.625	CGO103M035L
14000	.0100	.0061	16.1	1.375	4.625	CGO143M035L
45 WVDC; 50 VDC Surge						
3800	.0320	.0177	8.1	1.375	2.125	CGO382M045L
4600	.0242	.0134	9.7	1.375	2.625	CGO462M045L
10000	.0219	.0128	15.6	1.375	4.625	CGO103M045L
55 WVDC; 64 VDC Surge						
2800	.0302	.0150	7.5	1.375	2.125	CGO282M055L
3900	.0233	.0123	9.0	1.375	2.625	CGO392M055L
5000	.0188	.0102	10.6	1.375	3.125	CGO502M055L
10000	.0109	.0064	17.2	1.375	5.625	CGO103M055L

Type CGR
Computer Grade Capacitors

MALLORY

- High Ripple Current
- Very Low ESR
- 105°C Operation
- Custom Designs Available Upon Request
- Commercial Equivalent of MIL-C-35018/04, 06, 10

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +105°C

Voltage Range:
7.5 WVDC to 200 WVDC

Capacitance Range:
330 μF to 100,000 μF

Capacitance Tolerance:
-10% +75% (7.5 - 50 WVDC)
-10% +50% (51- 200 WVDC)

DC Leakage Current:
$I = 6 \times 10^{-6}$ CV after 5 minutes
Not to exceed 4 mA
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in mA

QA Stability Test:
Apply WVDC for 2,000 hrs at 105°C
- Capacitance change ≤15% from initial limits
- DC leakage current meets initial limits
- ESR ≤175% of initial measured value

The maximum ripple current at 85°C and 120 Hz for CGR capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables:

Rated WVDC	Ripple Multipliers				
	120 Hz	400 Hz	1000 Hz	2500Hz	10KHz
10 to 75	1.0	1.050	1.085	1.135	1.150
76 to 250	1.0	1.075	1.125	1.155	1.210

Ambient Temperature	Ripple Multiplier
+85°C	1.00
+65°C	1.42
+55°C	1.58
+45°C	1.72
+35°C	1.88
+25°C	2.00

Aluminum Capacitors

Cap µF	Max ESR (ohms) @ 120 Hz	Max Ripple RMS Amps @ 120 Hz +85°C	Dia	Length	Catalog Number
7.5 WVDC; 12 VDC Surge					
34,000	.0128	14.4	1.750	3.125	CGR343U7R5U3C
47,000	.0098	17.8	2.000	3.125	CGR473U7R5V3C
66,000	.0068	23.8	2.000	4.125	CGR663U7R5V4C
10 WVDC; 12 VDC Surge					
24,000	.0110	9.5	1.375	3.125	CGR243U010R3C
12 WVDC; 15 VDC Surge					
12,000	.0154	10.6	1.375	2.625	CGR123U012R2L
100,000	.0043	30.0	2.500	5.125	CGR104U012W5C
16 WVDC; 20 VDC Surge					
7,700	.0231	7.9	1.375	2.125	CGR772U016R2C
11,000	.0161	10.3	1.375	2.625	CGR113U016R2L
14,000	.0119	12.9	1.375	3.125	CGR143U016R3C
16,000	.0173	11.6	1.750	2.625	CGR163U016U2L
20,000	.0084	17.2	1.375	4.125	CGR203U016R4C
30,000	.0098	17.8	2.000	3.125	CGR303U016V3C
42,000	.0075	22.7	2.000	4.125	CGR423U016V4C
51,000	.0085	22.0	2.500	3.125	CGR513U016W3C
20 WVDC; 30 VDC Surge					
4,600	.0224	8.1	1.375	2.125	CGR462U020R2C
10,000	.0105	14.6	1.375	3.625	CGR103U020R3L
21,000	.0090	19.7	2.000	3.625	CGR213U020V3L

Cap µF	Max ESR (ohms) @ 120 Hz	Max Ripple RMS Amps @ 120 Hz +85°C	Dia	Length	Catalog Number
30 WVDC; 45 VDC Surge					
2,200	.0350	5.9	1.375	1.875	CGR222U030R1N
4,900	.0248	10.3	1.750	2.125	CGR492U030U2C
7,400	.0105	14.6	1.375	3.625	CGR742U030R3L
10,000	.0077	18.9	1.375	4.625	CGR103U030R4L
12,000	.0098	17.8	2.000	3.125	CGR123U030V3C
15,000	.0090	19.7	2.000	3.625	CGR153U030V3L
27,000	.0053	30.0	2.000	5.625	CGR273U030V5L
30,000	.0060	29.1	2.500	4.125	CGR303U030W4C
40 WVDC; 60 VDC Surge					
2,100	.0245	7.7	1.375	2.125	CGR212U040R2C
3,900	.0133	12.2	1.375	3.125	CGR392U040R3C
5,600	.0091	16.6	1.375	4.125	CGR562U040R4C
7,400	.0100	12.3	1.375	5.125	CGR742U040R5C
9,600	.0090	19.7	2.000	3.625	CGR962U040V3L
13,000	.0068	25.0	2.000	4.625	CGR133U040V4L
22,000	.0060	30.0	2.500	4.625	CGR223U040W4L
31,000	.0051	30.0	3.000	4.625	CGR313U040X4L
50 WVDC; 75 VDC Surge					
1,000	.1001	3.5	1.375	1.875	CGR102U050R1N
1,500	.0672	4.7	1.375	2.125	CGR152U050R2C
2,900	.0357	7.4	1.375	3.125	CGR292U050R3C
4,100	.0180	8.3	1.375	4.125	CGR412U050R4C
6,200	.0168	14.0	1.375	5.625	CGR622U050R5L
7,600	.0165	13.7	2.000	3.125	CGR762U050V3C
10,000	.0113	18.5	2.000	4.125	CGR103U050V4C
16,000	.0085	24.2	2.000	5.625	CGR163U050V5L
21,000	.0077	26.8	2.500	4.625	CGR213U050W4L
27,000	.0060	30.0	2.500	5.625	CGR273U050W5L
37,000	.0051	30.0	3.000	5.625	CGR373U050X5L

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type CGR
Computer Grade Capacitors

MALLORY

Cap µF	Max ESR (ohms) @ 120 Hz	Max Ripple RMS Amps @ 120 Hz +85°C	Dia	Length	Catalog Number
75 WVDC; 100 VDC Surge					
1,200	.0497	5.9	1.375	2.625	CGR122T075R2L
1,800	.0329	8.2	1.375	3.625	CGR182T075R3L
2,000	.0220	6.7	1.375	3.125	CGR202U075R3C
2,200	.0200	7.9	1.375	4.125	CGR222T075R4C
3,100	.0350	11.0	2.000	2.625	CGR312T075V2L
4,100	.0140	10.9	1.750	4.125	CGR412T075U4C
4,700	.0150	15.2	2.000	3.625	CGR472T075V3L
7,500	.0095	16.2	2.000	5.625	CGR752U075V5L
8,000	.0085	16.4	2.500	3.625	CGR802T075W3L
9,600	.0094	23.2	2.500	4.125	CGR962T075W4C
11,000	.0102	23.8	3.000	3.625	CGR113T075X3L
19,000	.0056	30.0	3.000	5.625	CGR193T075X5L

Cap µF	Max ESR (ohms) @ 120 Hz	Max Ripple RMS Amps @ 120 Hz +85°C	Dia	Length	Catalog Number
100 WVDC; 135 VDC Surge					
330	.0940	2.8	1.375	2.125	CGR331T100R2C
2,700	.0120	18.8	2.000	4.625	CGR272T100V4L
4,500	.0094	24.3	2.500	4.625	CGR452T100W4L
8,000	.0085	21.8	3.000	5.625	CGR802T100X5L
200 WVDC; 250 VDC Surge					
3,500	.0240	11.5	3.000	4.125	CGR352T200X4C
5,200	.0170	15.4	3.000	5.625	CGR522T200X5L

Type HES
Computer Grade Capacitors

MALLORY

- High Reliability
- 105°C Operation
- Custom Designs Available Upon Request
- Charge-Discharge Applications
  - Welders
  - Photoflash
  - Strobe Lights
  - Magnetizers
  - Demagnetizers
  - Laser Activation
- Ideal for High Power Input Filter Applications

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +105°C

Voltage Range:
350 WVDC to 450 WVDC

Capacitance Range:
300 μF to 5,600 μF

Capacitance Tolerance:
-0 +50%

DC Leakage Current:
$I = \leq 3\sqrt{CV}$ mA
Not to exceed 4.0 mA
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in mA

QA Stability Test:
- Life Test:
  1000 Hrs. @+105°C
- Ripple Test:
  2000 Hrs. full load @+85°C
- Shelf Test:
  500 Hrs. @+105°C

The maximum ripple current at 85°C and 120 Hz for HES capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables:

Rated WVDC	Ripple Multipliers				
	120Hz	400Hz	1000Hz	2500Hz	10kHz
350 to 450	1.00	1.08	1.113	1.175	1.23

Ambient Temperature	Ripple Multiplier
+85°C	1.00
+65°C	1.42
+55°C	1.58
+45°C	1.72
+35°C	1.88
+25°C	2.00

350 WVDC; 400 VDC Surge

Cap μF	Max ESR (ohms) @ 120 Hz	Max Ripple RMS Amps @ 120 Hz +85°C	Dia	Length	Catalog Number
600	0.173	2.60	2.000	2.125	HES601G350V2C
900	0.110	4.60	2.000	5.125	HES901G350V5C
1,100	0.099	4.00	2.000	3.125	HES112G350V3C
1,400	0.080	6.20	2.500	5.125	HES142G350W5C
1,600	0.062	5.60	2.000	4.125	HES162G350V4C
1,900	0.053	6.40	2.000	4.625	HES192G350V4L
2,500	0.045	7.40	2.500	4.125	HES252G350W4C
3,100	0.040	8.60	3.000	3.625	HES312G350X3L
3,400	0.034	9.40	2.500	5.125	HES342G350W5C
3,700	0.034	9.80	3.000	4.125	HES372G350X4C
4,400	0.029	11.00	3.000	4.625	HES442G350X4L
5,000	0.026	12.10	3.000	5.125	HES502G350X5C
5,600	0.024	13.20	3.000	5.625	HES562G350X5L

400 WVDC; 450 VDC Surge

Cap μF	Max ESR (ohms) @ 120 Hz	Max Ripple RMS Amps @ 120 Hz +85°C	Dia	Length	Catalog Number
300	0.275	2.20	1.750	3.125	HES301G400U3C
500	0.180	2.60	2.000	2.125	HES501G400V2C
1,300	0.066	5.40	2.000	4.125	HES132G400V4C
2,000	0.044	14.30	2.000	5.625	HES202G400V5L
2,000	0.048	7.30	2.500	4.125	HES202G400W4C
2,100	0.045	9.50	3.000	5.625	HES212G400X5L
3,000	0.033	9.90	2.500	5.625	HES302G400W5L
3,500	0.031	10.70	3.000	4.625	HES352G400X4L
4,100	0.027	11.90	3.000	5.125	HES412G400X5C
4,600	0.025	13.00	3.000	5.625	HES462G400X5L

450 WVDC; 525 VDC Surge

Cap μF	Max ESR (ohms) @ 120 Hz	Max Ripple RMS Amps @ 120 Hz +85°C	Dia	Length	Catalog Number
300	0.268	2.40	2.000	3.125	HES301G450V3C
400	0.203	2.90	2.000	3.625	HES401G450V3L
550	0.150	3.60	2.000	4.125	HES551G450V4C
700	0.125	3.50	2.000	3.125	HES701G450V3C
1,200	0.069	7.10	3.000	4.625	HES122G450X4L
1,500	0.056	8.50	3.000	5.625	HES152G450X5L
1,600	0.053	6.90	2.000	5.625	HES162G450V5L
1,700	0.051	7.10	2.500	4.125	HES172G450W4C
2,000	0.041	9.70	3.000	5.625	HES202G450X5L
2,200	0.040	10.10	3.000	5.625	HES222G450X5L
2,400	0.038	9.00	2.500	5.125	HES242G450W5C
2,700	0.034	9.90	2.500	5.625	HES272G450W5L
3,600	0.028	11.70	3.000	5.125	HES362G450X5C
4,000	0.025	12.70	3.000	5.625	HES402G450X5L

Type LP
Radial Snap-In Capacitors

MALLORY

- 105°C - Long Life
- 22 to 35 mm Diameters
  10 mm Lead Spacing
- High Reliability
- Stable ESR
- Ideally Suited for Use in
  Switchable Power Supplies

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +105°C

Voltage Range:
16 WVDC to 250 WVDC

Capacitance Range:
100 μF to 47,000 μF

Capacitance Tolerance:
± 20% (Standard)

DC Leakage Current:
I = .02 CV
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Load Life: Apply WVDC for 1,000 hrs at 105°C
- Capacitance change ±20% from initial limits
- DC leakage current meets initial limits
- ESR ≤ 200% of initial measured value

Shelf Life: 500 hrs, No Voltage Applied @ 105°C
- Capacitance change ±20% from initial limits
- DC leakage current ≤ 200% of initial measured value
- ESR ≤ 200% of initial measured value

The maximum ripple current at 105°C and 120 Hz for LP capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers					
	50 Hz	1000Hz	300Hz	1000Hz	10kHz	100kHz
10 to 50	.90	1.0	1.03	1.05	1.10	1.10
63 to 100	.85	1.0	1.07	1.13	1.19	1.20
160 to 250	.80	1.0	1.15	1.25	1.35	1.40

Ambient Temperature	Ripple Multiplier
+85°C	1.65
+65°C	2.25
+45°C	2.55

Dissipation Factor @ 120Hz, 25°C				
WV	16	25 - 35	50 -63	100 - 250
DF(%)	30	25	20	15

For capacitors whose capacitance value exceeds 1000μF, the value of DF(%) is increased 2% for every additional 1000μF.

Cap µF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 105°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
16 WVDC; 25 VDC Surge							
4,700	.141	1.200	.866	.984	22	25	LP472M016A1P3
5,600	.120	1.429	.984	.984	25	25	LP562M016C1P3
8,200	.081	1.820	.866	1.378	22	35	LP822M016A5P3
8,200	.080	1.771	1.181	.984	30	25	LP822M016E1P3
12,000	.055	2.380	1.181	1.181	30	30	LP123M016E3P3
15,000	.046	3.000	1.378	1.181	35	30	LP153M016H3P3
22,000	.030	3.530	1.181	1.575	30	40	LP223M016E7P3
27,000	.025	4.270	1.378	1.575	35	40	LP273M016H7P3
33,000	.020	5.000	1.378	1.969	35	50	LP333M016H9P3
25 WVDC; 32 VDC Surge							
2,700	.180	1.000	.984	.984	25	25	LP272M025C1P3
3,300	.151	1.160	.866	.984	22	25	LP332M025A1P3
3,300	.150	1.143	.984	.984	25	25	LP332M025C1P3
4,700	.106	1.480	.984	.984	25	25	LP472M025C1P3
5,600	.090	1.857	1.181	.984	30	25	LP562M025E1P3
5,600	.089	1.730	.984	1.181	25	30	LP562M025C3P3
6,800	.073	1.940	.984	1.378	25	35	LP682M025C5P3
10,000	.050	3.333	1.378	1.181	35	30	LP103M025H3P3
12,000	.041	2.970	1.378	1.181	35	30	LP123M025H3P3
15,000	.033	3.360	1.181	1.575	30	40	LP153M025E7P3
22,000	.023	4.857	1.378	1.969	35	50	LP223M025H9P3
35 WVDC; 44 VDC Surge							
1,800	.188	1.040	.866	.984	22	25	LP182M035A1P3
2,700	.155	1.257	.984	.984	25	25	LP272M035C1P3
3,900	.108	1.571	1.181	.984	30	25	LP392M035E1P3
5,600	.074	2.050	1.181	1.181	30	30	LP562M035E3P3
6,800	.060	2.286	1.181	1.378	30	35	LP682M035E5P3
6,800	.061	2.320	.984	1.575	25	40	LP682M035C7P3
8,200	.051	2.690	1.378	1.181	35	30	LP822M035H3P3
10,000	.041	3.000	1.181	1.575	30	40	LP103M035E7P3
12,000	.035	3.590	1.378	1.575	35	40	LP123M035H7P3
15,000	.028	4.000	1.378	1.969	35	50	LP153M035H9P3

Cap µF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 105°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
50 WVDC; 63 VDC Surge							
1,200	.280	.860	.866	.984	22	25	LP122M050A1P3
1,500	.225	.983	.866	.984	22	25	LP152M050A1P3
2,200	.151	1.330	.866	1.378	22	35	LP222M050A5P3
2,200	.150	1.429	1.181	.984	30	25	LP222M050E1P3
3,300	.101	.176	1.181	1.181	30	30	LP332M050E3P3
3,300	.101	1.710	.984	1.378	25	35	LP332M050C5P3
3,300	.101	1.710	.984	1.181	25	30	LP332M050C3P3
3,900	.085	1.970	.984	1.575	25	40	LP392M050C7P3
4,700	.071	2.270	1.378	1.181	35	30	LP472M050H3P3
5,600	.059	2.600	1.378	1.378	35	35	LP562M050H5P3
6,800	.049	3.160	1.181	1.575	30	40	LP682M050E7P3
6,800	.049	3.160	1.181	1.969	30	50	LP682M050E9P3
8,200	.040	3.429	1.378	1.969	35	50	LP822M050H9P3
63 WVDC; 75 VDC Surge							
820	.300	.770	.866	.984	22	25	LP821M063A1P3
1,200	.210	.990	.984	.984	25	25	LP122M063C1P3
1,800	.138	1.340	.866	1.575	22	40	LP182M063A7P3
1,800	.140	1.371	1.181	.984	30	25	LP182M063E1P3
2,200	.113	1.550	1.181	1.181	30	30	LP222M063E3P3
3,300	.076	1.200	1.378	1.181	35	30	LP332M063H3P3
4,700	.053	2.840	1.181	1.969	30	50	LP472M063E9P3
6,800	.037	3.360	1.378	1.969	35	50	LP682M063H9P3
100 WVDC; 125 VDC Surge							
820	.300	.980	1.181	.984	30	25	LP821M100E1P3
2,200	.113	2.030	1.378	1.575	35	40	LP222M100H7P3
2,700	.092	2.320	1.378	1.969	35	50	LP272M100H9P3
2,700	.092	2.320	1.378	1.575	35	40	LP272M100H7P3

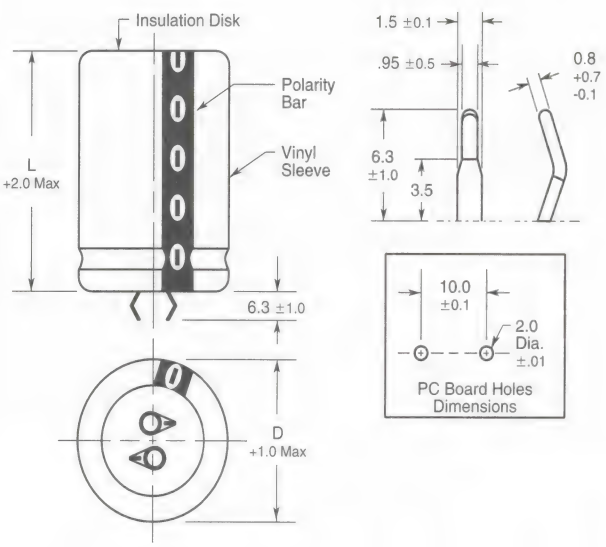
Type LP
Radial Snap-In Capacitors

MALLORY

Cap µF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 105°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
200 WVDC; 250 VDC Surge							
150	1.650	.509	.984	.984	25	25	LP151M200C1P3
150	1.650	.509	.866	.984	22	25	LP151M200A1P3
180	1.400	.571	.984	.984	25	25	LP181M200C1P3
220	1.100	.646	.984	.984	25	25	LP221M200C1P3
220	1.100	.646	1.181	.984	30	25	LP221M200E1P3
220	1.130	.660	.866	1.181	22	30	LP221M200A3P3
270	.920	.790	1.181	.984	30	25	LP271M200E1P3
270	.920	.790	.984	1.181	25	30	LP271M200C3P3
330	.750	.886	1.181	1.181	30	30	LP331M200E3P3
390	.640	.980	.984	1.378	25	35	LP391M200C5P3
470	.540	1.143	1.181	1.378	30	35	LP471M200E5P3
470	.540	1.140	1.181	.984	30	25	LP471M200E1P3
470	.540	1.143	1.378	1.181	35	30	LP471M200H3P3
560	.440	1.310	1.378	1.181	35	30	LP561M200H3P3
680	.370	1.520	1.181	1.181	30	30	LP681M200E3P3
680	.370	1.510	1.181	1.378	30	35	LP681M200E5P3
680	.370	1.510	1.378	.984	35	25	LP681M200H1P3
820	.300	1.750	1.378	1.575	35	40	LP821M200H7P3
820	.300	1.750	1.378	1.181	35	30	LP821M200H3P3
1,000	.250	2.114	1.378	1.969	35	50	LP102M200H9P3
1,000	.250	2.114	1.378	1.378	35	35	LP102M200H5P3
1,200	.165	2.810	1.181	1.969	30	50	LP122M200E9P3
1,200	.165	2.740	1.378	1.378	35	35	LP122M200H5P3
1,500	.134	3.330	1.378	1.772	35	45	LP152M200H4P3
1,800	.112	3.800	1.378	1.969	35	50	LP182M200H9P3

Cap µF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 105°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
250 WVDC; 300 VDC Surge							
100	2.500	.410	.866	.984	22	25	LP101M250A1P3
150	1.660	.540	.984	.984	25	25	LP151M250C1P3
180	1.400	.686	.984	1.181	25	30	LP181M250C3P3
220	1.130	.710	1.181	.984	30	25	LP221M250E1P3
270	.922	.840	.984	1.181	25	30	LP271M250C3P3
330	.750	.914	1.181	1.181	30	30	LP331M250E3P3
390	.640	1.090	1.378	1.181	35	30	LP391M250H3P3
470	.530	1.260	1.181	1.575	30	40	LP471M250E7P3
470	.530	1.260	1.378	.984	35	25	LP471M250H1P3
560	.347	1.800	1.378	1.181	35	30	LP561M250H3P3
680	.370	1.920	1.181	1.969	30	50	LP681M250E9P3
680	.370	2.070	1.378	1.378	35	35	LP681M250H5P3
820	.243	2.400	1.378	1.575	35	40	LP821M250H7P3
1,000	.200	2.720	1.378	1.772	35	45	LP102M250H4P3
1,200	.165	3.100	1.378	1.969	35	50	LP122M250H9P3

Outline Dimensions



Dimensions are in Millimeters

Part Number Nomenclature

NACC Catalog Number: LP 562 M 016 C1 P 3

TYPE NUMBER:
Identifies the basic type

CAPACITANCE:
Expressed in microfarads
The first two digits are significant figures
The third digit is the number of zeros

CAPACITANCE TOLERANCE:
M = ± 20%

DC VOLTAGE RATING:
Zeros are used to precede the voltage rating where necessary to complete the three digit block
The letter 'R' indicates a decimal point

CASE CODE:
See chart

POLARITY:

INSULATING SLEEVE:
3 = PVC Sleeve

Case Code Chart

Millimeters
(Inches)

Diameter mm	(Inches)	Length 25 (1.00)	30 (1.18)	35 (1.38)	40 (1.57)	45 (1.77)	50 (2.00)
22	(.87)	A1	A3	A5	A7	A4	A9
25	(1.00)	C1	C3	C5	C7	C4	C9
30	(1.18)	E1	E3	E5	E7	E4	E9
35	(1.38)	H1	H3	H5	H7	H4	H9

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type LPW
Radial Snap-In Capacitors

MALLORY

- 85°C - Low Voltage General Purpose
- 22 to 35 mm Diameters 10 mm Lead Spacing
- Ideal For Input Filter in Consumer Electronic Equipment

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
10 WVDC to 100 WVDC

Capacitance Range:
820 μF to 22,000 μF

Capacitance Tolerance:
± 20%

DC Leakage Current:
I ≤.03CV or 3mA
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVDC for 1,000 hrs at 85°C

- Capacitance change ≤ 20% from initial limits
- DC leakage current meets initial limits
- ESR ≤ 150% of initial measured value

See Type LPX for 85°C - High Voltage (160 to 450 WVDC) General Purpose Snap Mount Capacitors

The maximum ripple current at 85°C and 120 Hz for LPW capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers				
	60 Hz	120 Hz	1kHz	10kHz	100kHz
10 to 35	.90	1.0	1.05	1.10	1.10
50 to 100	.90	1.0	1.15	1.20	1.20

Dissipation Factor at 120 Hz, 25°C				
WV	10- 16	25-35	50-63	100
DF%	30	25	20	15

For capacitors whose capacitance value exceeds 1000μF, the value of DF(%) is decreased 2% for every additional 1000μF.

Ambient Temperature	Ripple Multiplier
+70°C	1.20
+60°C	1.30
+45°C	1.55

Cap μF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 85°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
10 WVDC; 13 VDC Surge							
8,200	.101	2.39	.866	.984	22	25	LPW822M1AN25V-W
8,200	.101	2.46	.984	.984	25	25	LPW822M1AO25V-W
10,000	.083	2.69	.866	1.181	22	30	LPW103M1AN30V-W
10,000	.083	2.57	.984	.984	25	25	LPW103M1AO25V-W
12,000	.083	2.81	.866	1.181	22	30	LPW123M1AN30V-W
12,000	.083	2.84	1.181	.984	30	25	LPW123M1AP25V-W
15,000	.066	3.14	.866	1.378	22	35	LPW153M1AN35V-W
15,000	.066	2.97	1.181	.984	30	25	LPW153M1AP25V-W
22,000	.045	3.79	.866	1.772	22	45	LPW223M1AN45V-W
22,000	.045	3.45	1.181	1.181	30	30	LPW223M1AP30V-W
16 WVDC; 20 VDC Surge							
4,700	.141	1.81	.866	.984	22	25	LPW472M1CN25V-W
4,700	.141	2.21	.984	.984	25	25	LPW472M1CO25V-W
6,800	.122	2.40	.866	.984	22	25	LPW682M1CN25V-W
6,800	.122	2.47	.984	.984	25	25	LPW682M1CO25V-W
8,200	.101	2.70	.866	1.181	22	30	LPW822M1CN30V-W
8,200	.101	2.73	1.181	.984	30	25	LPW822M1CP25V-W
10,000	.083	3.00	.866	1.378	22	35	LPW103M1CN35V-W
10,000	.083	2.84	1.181	.984	30	25	LPW103M1CP25V-W
12,000	.069	3.30	.866	1.575	22	40	LPW123M1CN40V-W
12,000	.069	3.16	1.181	1.181	30	30	LPW123M1CP30V-W
15,000	.055	3.62	.866	1.772	22	45	LPW153M1CN45V-W
15,000	.055	3.55	1.378	.984	35	25	LPW153M1CQ25V-W
22,000	.038	4.25	.984	1.772	25	45	LPW223M1CO45V-W
22,000	.038	4.37	1.378	1.181	35	30	LPW223M1CQ30V-W
25 WVDC; 32 VDC Surge							
3,300	.176	2.03	.866	.984	22	25	LPW332M1EN25V-W
3,300	.176	2.09	.984	.984	25	25	LPW332M1EO25V-W
4,700	.159	2.49	.866	1.181	22	30	LPW472M1EN30V-W
4,700	.159	2.31	.984	.984	25	25	LPW472M1EO25V-W
6,800	.110	2.87	.866	1.378	22	35	LPW682M1EN35V-W
6,800	.110	2.72	1.181	.984	30	25	LPW682M1EP25V-W
8,200	.091	3.16	.866	1.575	22	40	LPW822M1EN40V-W
8,200	.091	3.03	1.181	1.181	30	30	LPW822M1EP30V-W
10,000	.075	3.45	.866	1.772	22	45	LPW103M1EN45V-W
10,000	.075	3.14	1.181	1.181	30	30	LPW103M1EP30V-W
25 WVDC; 32 VDC Surge							
12,000	.062	3.74	.866	1.969	22	50	LPW123M1EN50V-W
12,000	.062	3.75	1.378	1.181	35	30	LPW123M1EQ30V-W
15,000	.050	3.78	.984	1.772	25	45	LPW153M1EO45V-W
15,000	.050	3.89	1.378	1.181	35	30	LPW153M1EQ30V-W
22,000	.034	4.94	1.181	1.969	30	50	LPW223M1EP50V-W
35 WVDC; 44 VDC Surge							
3,300	.176	2.04	.866	.984	22	25	LPW332M1VN25V-W
3,300	.176	2.10	.984	.984	25	25	LPW332M1VO25V-W
4,700	.123	2.41	.866	1.181	22	30	LPW472M1VN30V-W
4,700	.123	2.44	1.181	.984	30	25	LPW472M1VP25V-W
6,800	.085	2.98	.866	1.575	22	40	LPW682M1VN40V-W
6,800	.085	2.86	1.181	1.181	30	30	LPW682M1VP30V-W
8,200	.071	3.25	.866	1.772	22	45	LPW822M1VN45V-W
8,200	.071	3.42	1.378	1.181	35	30	LPW822M1VQ30V-W
10,000	.058	3.41	.984	1.772	25	45	LPW103M1VO45V-W
10,000	.058	3.51	1.378	1.181	35	30	LPW103M1VQ30V-W
12,000	.048	3.68	.984	1.969	25	50	LPW123M1VO50V-W
12,000	.048	3.84	1.378	1.378	35	35	LPW123M1VQ35V-W
15,000	.039	4.08	1.181	1.772	30	45	LPW153M1VP45V-W
50 WVDC; 63 VDC Surge							
2,200	.226	1.92	.866	.984	22	25	LPW222M1HN25V-W
2,200	.226	1.98	.984	.984	25	25	LPW222M1HO25V-W
3,300	.151	2.51	.866	1.378	22	35	LPW332M1HN35V-W
3,300	.151	2.38	1.181	.984	30	25	LPW332M1HP25V-W
4,700	.106	2.89	.866	1.575	22	40	LPW472M1HN40V-W
4,700	.106	2.99	1.378	.984	35	25	LPW472M1HQ25V-W
6,800	.073	3.37	.984	1.772	25	45	LPW682M1HO45V-W
6,800	.073	3.46	1.378	1.181	35	30	LPW682M1HQ30V-W
8,200	.061	3.62	.984	1.969	25	50	LPW822M1HO50V-W
8,200	.061	3.79	1.378	1.378	35	35	LPW822M1HQ35V-W
10,000	.050	3.72	1.181	1.772	30	45	LPW103M1HP45V-W

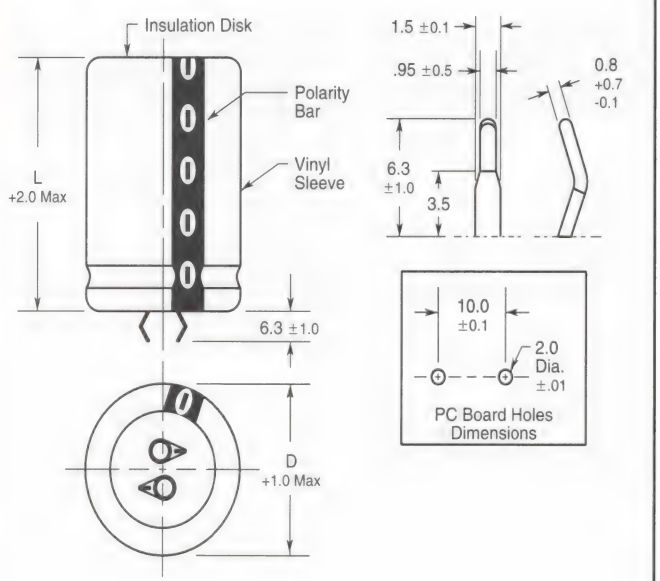
Type LPW
Radial Snap-In Capacitors

MALLORY

Cap µF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 85°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
63 WVDC; 79 VDC Surge							
1,000	.414	1.42	.866	.984	22	25	LPW102M1JN25V-W
1,000	.414	1.46	.984	.984	25	25	LPW102M1JO25V-W
1,500	.276	1.74	.866	.984	22	25	LPW152M1JN25V-W
1,500	.276	1.81	1.181	.984	30	25	LPW152M1JP25V-W
2,200	.226	2.08	.866	1.181	22	30	LPW222M1JN30V-W
2,200	.226	2.10	1.181	.984	30	25	LPW222M1JP25V-W
3,300	.151	2.81	.866	1.772	22	45	LPW332M1JN45V-W
3,300	.151	2.76	1.378	.984	35	25	LPW332M1JQ25V-W
4,700	.106	3.11	.984	1.772	25	45	LPW472M1JO45V-W
4,700	.106	3.20	1.378	1.181	35	30	LPW472M1JQ30V-W
6,800	.073	3.54	1.181	1.772	30	45	LPW682M1JP45V-W

Cap µF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 85°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
100 WVDC; 125 VDC Surge							
820	.404	1.55	.866	1.181	22	30	LPW821M2AN30V-W
820	.404	1.54	.984	.984	25	25	LPW821M2AO25V-W
1,000	.332	1.71	.866	1.181	22	30	LPW102M2AN30V-W
1,000	.332	2.20	1.181	.984	30	25	LPW102M2AP25V-W
1,500	.276	2.38	.866	1.575	22	40	LPW152M2AN40V-W
1,500	.276	2.54	1.378	1.181	35	30	LPW152M2AQ30V-W
2,200	.188	2.77	.984	1.772	25	45	LPW222M2AO45V-W
2,200	.188	3.07	1.378	1.181	35	30	LPW222M2AQ30V-W
3,300	.126	3.27	1.181	1.772	30	45	LPW332M2AP45V-W

Outline Dimensions



Dimensions are in Millimeters

Part Number Nomenclature

NACC Catalog Number: LPW 332 M 1J Q 25 V-W

TYPE NUMBER:
Identifies the basic type

CAPACITANCE:
Expressed in microfarads
The first two digits are significant figures
The third digit is the number of zeros

CAPACITANCE TOLERANCE:
M = ± 20%

DC VOLTAGE RATING CODE:
1A = 10 WVDC
1C = 16 WVDC
1E = 25 WVDC
1V = 35 WVDC
1H = 50 WVDC
1J = 63 WVDC
2A =100 WVDC

CASE DIAMETER CODE:
N = 22 Millimeters
O = 25 Millimeters
P = 30 Millimeters
Q = 35 Millimeters

CASE LENGTH:
Millimeters

CASE TYPE and TERMINATION:
V = Vented Case
— = (Dash must be included)
W = Snap-In Terminals

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type LPX
Radial Snap-In Capacitors

MALLORY

- 85°C - High Voltage General Purpose
- High Capacitance
- 22 to 35 mm Diameters 10 mm Lead Spacing
- Ideal For Input Filter in SMPS

See Type LPW for 85°C - Low Voltage (10 to 100WVDC) General Purpose Snap Mount Capacitors

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
160 WVDC to 450 WVDC

Capacitance Range:
56 μF to 2,700 μF

Capacitance Tolerance:
± 20%

DC Leakage Current:
$I = 3\sqrt{CV}$
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Load Life: Apply WVDC for 1,000 hrs at 85°C
- Capacitance change ±20% from initial limits
- DC leakage current meets initial limits
- ESR ≤ 200% of initial measured value

Shelf Life: 500 hrs, No Voltage Applied @ 85°C
- Capacitance change ±20% from initial limits
- DC leakage current ≤ 200% of initial measured value
- ESR ≤ 200% of initial measured value

The maximum ripple current at 85°C and 120 Hz for LPX capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers		
	120 Hz	1000 Hz	10 to 50 KHz
160 to 250	1.0	1.15	1.20
315 to 450	1.0	1.10	1.15

Ambient Temperature	Ripple Multiplier
+75°C	1.6
+65°C	2.2
+55°C	2.6
+45°C	3.0

Dissipation Factor @ 120Hz, 25°C		
WV	160 - 250	400 -450
DF(%)	15	20

For capacitors whose capacitance value exceeds 1000μF, the value of DF(%) is increased 2% for every additional 1000μF.

Cap µF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 85°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
160 WVDC; 200 VDC Surge							
390	.510	1.3	.866	.984	22	25	LPX391M160A1P3
470	.423	1.6	.984	.984	25	25	LPX471M160C1P3
470	.423	1.6	.866	1.181	22	30	LPX471M160A3P3
560	.355	1.8	.984	1.181	25	30	LPX561M160C3P3
560	.355	1.8	.866	1.378	22	35	LPX561M160A5P3
680	.293	2.0	1.181	.984	30	25	LPX681M160E1P3
680	.293	2.1	.866	1.575	22	40	LPX681M160A7P3
680	.293	2.0	.984	1.181	25	30	LPX681M160C3P3
820	.243	2.0	.984	1.378	25	35	LPX821M160C5P3
820	.243	2.3	1.181	1.181	30	30	LPX821M160E3P3
820	.243	2.4	.866	1.772	22	45	LPX821M160A4P3
1,000	.199	2.6	.984	1.575	25	40	LPX102M160C7P3
1,000	.199	2.3	1.378	.984	35	25	LPX102M160H1P3
1,000	.199	2.5	1.181	1.181	30	30	LPX102M160E3P3
1,200	.166	3.0	.984	1.772	25	45	LPX122M160C4P3
1,200	.166	2.6	1.378	1.181	35	30	LPX122M160H3P3
1,200	.166	2.9	1.181	1.378	30	35	LPX122M160E5P3
1,500	.133	3.3	1.378	1.378	35	35	LPX152M160H5P3
1,500	.133	3.3	1.181	1.575	30	40	LPX152M160E7P3
1,800	.111	4.0	1.181	1.969	30	50	LPX182M160E9P3
1,800	.111	3.7	1.378	1.575	35	40	LPX182M160H7P3
2,200	.090	4.2	1.378	1.772	35	45	LPX222M160H4P3
2,700	.074	4.6	1.378	1.969	35	50	LPX272M160H9P3
200 WVDC; 250 VDC Surge							
270	.737	1.2	.866	.984	22	25	LPX271M200A1P3
390	.510	1.6	.984	.984	25	25	LPX391M200C1P3
390	.510	1.6	.866	1.181	22	30	LPX391M200A3P3
470	.423	1.8	.984	1.181	25	30	LPX471M200C3P3
470	.423	1.8	.866	1.378	22	35	LPX471M200A5P3
560	.355	2.1	.866	1.575	22	40	LPX561M200A7P3
560	.355	2.1	.984	1.378	25	35	LPX561M200C5P3
560	.355	1.9	1.181	.984	30	25	LPX561M200E1P3

Cap µF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 85°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
200 WVDC; 250 VDC Surge							
680	.293	2.5	.984	1.575	25	40	LPX681M200C7P3
680	.293	2.4	.866	1.772	22	45	LPX681M200A4P3
680	.293	2.3	1.181	1.181	30	30	LPX681M200E3P3
820	.243	2.7	1.181	1.378	30	35	LPX821M200E5P3
820	.243	2.7	1.378	1.181	35	30	LPX821M200H3P3
820	.243	2.8	.984	1.772	25	45	LPX821M200C4P3
1,000	.199	2.7	1.378	1.181	35	30	LPX102M200H3P3
1,000	.199	3.1	1.181	1.575	30	40	LPX102M200E7P3
1,200	.166	3.1	1.378	1.378	35	35	LPX122M200H5P3
1,200	.166	3.5	1.181	1.772	30	45	LPX122M200E4P3
1,500	.133	4.0	1.181	1.969	30	50	LPX152M200E9P3
1,500	.133	3.6	1.378	1.575	35	40	LPX152M200H7P3
1,800	.111	4.0	1.378	1.772	35	45	LPX182M200H4P3
2,200	.090	4.5	1.378	1.969	35	50	LPX222M200H9P3
250 WVDC; 300 VDC Surge							
270	.737	1.4	.866	1.181	22	30	LPX271M250A3P3
270	.737	1.4	.984	.984	25	25	LPX271M250C1P3
330	.603	1.7	.984	1.181	25	30	LPX331M250C3P3
330	.603	1.7	.866	1.378	22	35	LPX331M250A5P3
390	.510	1.8	1.181	.984	30	25	LPX391M250E1P3
390	.510	1.9	.866	1.575	22	40	LPX391M250A7P3
390	.510	1.8	.984	1.181	25	30	LPX391M250C3P3
470	.423	2.2	.866	1.772	22	45	LPX471M250A4P3
470	.423	2.1	.984	1.378	25	35	LPX471M250C5P3
470	.423	2.1	1.181	1.181	30	30	LPX471M250E3P3
560	.355	2.5	.866	1.969	22	50	LPX561M250A9P3
560	.355	2.1	1.378	.984	35	25	LPX561M250H1P3
560	.355	2.2	1.181	1.181	30	30	LPX561M250E3P3
560	.355	2.4	.984	1.575	25	40	LPX561M250C7P3
680	.293	2.5	1.378	1.181	35	30	LPX681M250H3P3
680	.293	2.7	.984	1.772	25	45	LPX681M250C4P3
680	.293	2.6	1.181	1.378	30	35	LPX681M250E5P3

Type LPX
Radial Snap-In Capacitors

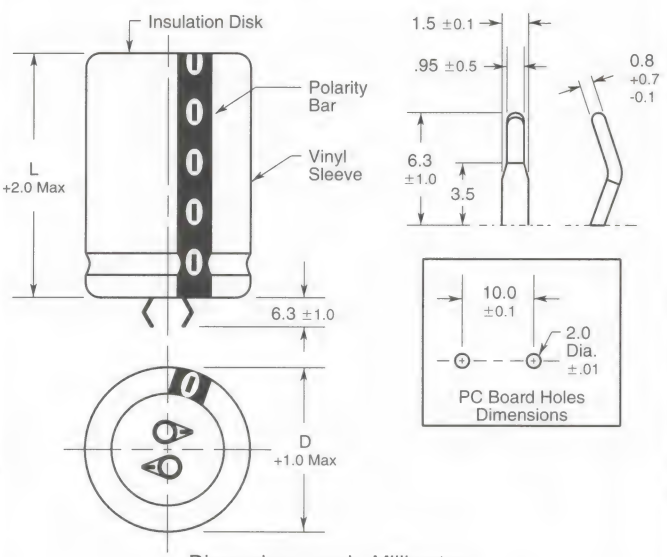
MALLORY

Aluminum Capacitors

Cap µF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 85°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
250 WVDC; 300 VDC Surge							
820	.243	3.0	1.378	1.378	35	35	LPX821M250H5P3
820	.243	3.0	1.181	1.575	30	40	LPX821M250E7P3
1,000	.199	3.4	1.378	1.575	35	40	LPX102M250H7P3
1,000	.199	3.4	1.181	1.772	30	45	LPX102M250E4P3
1,200	.166	3.8	1.378	1.772	35	45	LPX122M250H4P3
1,500	.133	4.2	1.378	1.969	35	50	LPX152M250H9P3
350 WVDC; 400 VDC Surge							
100	1.989	.6	.866	.984	22	25	LPX101M350A1P3
120	1.658	.7	.984	.984	25	25	LPX121M350C1P3
120	1.658	.7	.866	1.181	22	30	LPX121M350A3P3
150	1.326	.8	.984	1.181	25	30	LPX151M350C3P3
150	1.326	.8	.866	1.378	22	35	LPX151M350A5P3
180	1.105	.9	.866	1.575	22	40	LPX181M350A7P3
180	1.105	.9	.984	1.181	25	30	LPX181M350C3P3
180	1.105	1.0	1.181	.984	30	25	LPX181M350E1P3
220	.904	1.1	.866	1.772	22	45	LPX221M350A4P3
220	.904	1.1	1.181	1.181	30	30	LPX221M350E3P3
220	.904	1.1	.984	1.378	25	35	LPX221M350C5P3
270	.737	1.2	1.181	1.181	30	30	LPX271M350E3P3
270	.737	1.2	.984	1.575	25	40	LPX271M350C7P3
270	.737	1.3	.866	1.969	22	50	LPX271M350A9P3
270	.737	1.3	1.378	.984	35	25	LPX271M350H1P3
330	.603	1.4	.984	1.772	25	45	LPX331M350C4P3
330	.603	1.4	1.378	1.181	35	30	LPX331M350H3P3
330	.603	1.4	1.181	1.378	30	35	LPX331M350E5P3
390	.510	1.6	1.378	1.181	35	30	LPX391M350H3P3
390	.510	1.8	1.181	1.575	30	40	LPX391M350E7P3
470	.423	1.8	1.378	1.378	35	35	LPX471M350H5P3
470	.423	1.9	1.181	1.772	30	45	LPX471M350E4P3
560	.355	2.1	1.378	1.575	35	40	LPX561M350H7P3
680	.293	2.4	1.378	1.772	35	45	LPX681M350H4P3
400 WVDC; 450 VDC Surge							
82	2.426	.6	.866	.984	22	25	LPX820M400A1P3
100	1.989	.7	.866	1.181	22	30	LPX101M400A3P3
120	1.658	.7	.866	1.181	22	30	LPX121M400A3P3
120	1.658	.7	.984	.984	25	25	LPX121M400C1P3
150	1.326	.9	.984	1.181	25	30	LPX151M400C3P3
180	1.105	1.0	.866	1.575	22	40	LPX181M400A7P3

Cap µF	Max ESR Ohms @120Hz 25°C	Max Ripple Amps @120Hz 85°C	Size (inches) D	Size (inches) L	Size (millimeters) D	Size (millimeters) L	Catalog Number
400 WVDC; 450 VDC Surge							
180	1.105	1.0	.984	1.378	25	35	LPX181M400C5P3
220	.904	1.2	1.181	1.181	30	30	LPX221M400E3P3
220	.904	1.2	1.378	.984	35	25	LPX221M400H1P3
220	.904	1.2	.984	1.575	25	40	LPX221M400C7P3
270	.737	1.4	.984	1.772	25	45	LPX271M400C4P3
270	.737	1.4	1.181	1.378	30	35	LPX271M400E5P3
270	.737	1.4	1.378	1.181	35	30	LPX271M400H3P3
330	.603	1.6	1.181	1.575	30	40	LPX331M400E7P3
330	.603	1.5	1.378	1.181	35	30	LPX331M400H3P3
390	.510	1.8	1.378	1.378	35	35	LPX391M400H5P3
390	.510	1.8	1.181	1.772	30	45	LPX391M400E4P3
470	.423	2.0	1.378	1.575	35	40	LPX471M400H7P3
470	.423	2.0	1.181	1.969	30	50	LPX471M400E9P3
560	.355	2.3	1.378	1.772	35	45	LPX561M400H4P3
680	.293	2.6	1.378	1.969	35	50	LPX681M400H9P3
450 WVDC; 500 VDC Surge							
56	3.553	.5	.866	.984	22	25	LPX560M450A1P3
68	2.926	.6	.866	1.181	22	30	LPX680M450A3P3
82	2.426	.7	.984	.984	25	25	LPX820M450C1P3
82	2.426	.7	.866	1.181	22	30	LPX820M450A3P3
100	1.989	.8	.984	1.181	25	30	LPX101M450C3P3
100	1.989	.8	.866	1.378	22	35	LPX101M450A5P3
120	1.658	.9	1.181	.984	30	25	LPX121M450E1P3
120	1.658	1.0	.984	1.378	25	35	LPX121M450C5P3
120	1.658	.9	.866	1.575	22	40	LPX121M450A7P3
150	1.326	1.1	.866	1.969	22	50	LPX151M450A9P3
150	1.326	1.1	1.181	1.181	30	30	LPX151M450E3P3
150	1.326	1.1	.984	1.575	25	40	LPX151M450C7P3
180	1.105	1.3	.984	1.772	25	45	LPX181M450C4P3
180	1.105	1.2	1.378	.984	35	25	LPX181M450H1P3
180	1.105	1.4	1.181	1.575	30	40	LPX181M450E7P3
220	.904	1.5	1.378	1.181	35	30	LPX221M450H3P3
220	.904	1.5	.984	1.969	25	50	LPX221M450C9P3
220	.904	1.6	1.181	1.575	30	40	LPX221M450E7P3
270	.737	1.7	1.181	1.772	30	45	LPX271M450E4P3
270	.737	1.7	1.378	1.378	35	35	LPX271M450H5P3
330	.603	2.0	1.378	1.575	35	40	LPX331M450H7P3
330	.603	2.0	1.181	1.969	30	50	LPX331M450E9P3
390	.510	2.2	1.378	1.772	35	45	LPX391M450H4P3
470	.423	2.5	1.378	1.969	35	50	LPX471M450H9P3

Outline Dimensions



Dimensions are in Millimeters

Part Number Format

NACC Catalog Number: LPX 471 M 160 C1 P 3

TYPE NUMBER:
Identifies the basic type

CAPACITANCE:
Expressed in microfarads
The first two digits are significant figures
The third digit is the number of zeros

CAPACITANCE TOLERANCE:
M = ± 20%

DC VOLTAGE RATING:
Zeros are used to precede the voltage rating where necessary to complete the three digit block
The letter 'R' indicates a decimal point

CASE CODE:
See chart

POLARITY:

INSULATING SLEEVE:
3 = PVC Sleeve

Case Code Chart

Millimeters (Inches)

Diameter mm	(Inches)	Length 25 (1.00)	30 (1.18)	35 (1.38)	40 (1.57)	45 (1.77)	50 (2.00)
22	(.87)	A1	A3	A5	A7	A4	A9
25	(1.00)	C1	C3	C5	C7	C4	C9
30	(1.18)	E1	E3	E5	E7	E4	E9
35	(1.38)	H1	H3	H5	H7	H4	H9

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Part Number Information
Radial Aluminum Electrolytic Capacitors

MALLORY

SK **100** **M** **100** **S** **T**

Series Type:
SK, SEK, SH, SS,SN,SXR

Capacitance
Expressed in microfarads. The first two digits are significant figures, the third is the number of zeros. When the microfarads are less than 10 the letter "R" is used to indicate a decimal point. Examples:

MICROFARADS	NUMBER
3	3R0
10	100
100	101
1000	102

Capacitance Tolerance
K = ± 10%
M = ± 20%

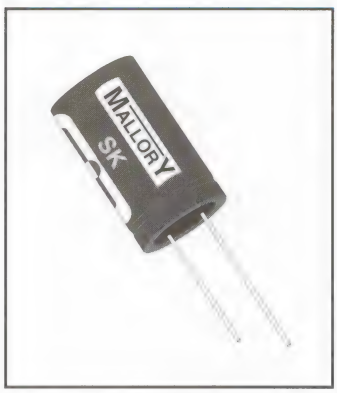
Rated Voltage
Rated Voltage is shown in Volts:
6R3 = 6.3 V
010 = 10 V
100 = 100V

Applicable Grade
A = Taping & Ammunition
E = Different characteristic
R = Tape & Reel
S = Standard

Configuration
1 = Lead cut
2 = Lead form
4 = Lead crimp & cut (form)
5 = Epoxy end seal
T = Standard

Type SK
Radial Leaded Capacitors

MALLORY



- 85°C General Purpose
- Radial Leads Miniature Size
- High CV per Case Size
- 2000 Hour Load Life
- Suitable for Consumer Electronic Products, Such as Stereo Radio, TV. etc.
- Low ESR and Leakage Current

SK parts are available taped in Ammo pack and taped and reeled. See page 124 for details.

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C
Voltage Range:
6.3 WVDC to 450 WVDC
Capacitance Range:
0.47μF to 15,000μF
Capacitance Tolerance:
±20%
DC Leakage Current:
6.3 - 100VDC
I = ≤ .001CV or 3μA whichever is greater after 2 minutes application of DC working voltage at 25°C
Over 100VDC
I = ≤ .03CV + 10μA Max after 2 minutes application of DC working voltage at 25°C
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVDC for 2,000 hrs at 85°C
- Capacitance change ≤20% from initial limits
- DC leakage current meets initial limits
- ESR ≤150% of initial measured value

Shelf Life:
500 hours; no voltage applied
- Capacitor change within 20% of initial values
- Dissipation factor not exceed 150% of initial requirements
- Leakage current: not exceed 200% of initial requirement

Dissipation Factor @ 120Hz, 25°C										
WV (V)	6.3	10	16	25	35	50	63	100	100-250	350-400
DF(%)	22	19	16	14	12	10	9	8	15	20

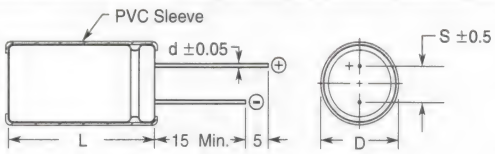
For capacitors whose capacitance value exceeds 1000μF, the value of DF(%) is increased 2% for every additional 1000μF.

The maximum ripple current at 85°C and 120 Hz for SK capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers		
	60Hz	120Hz	1kHz
6 to 25	.85	1.0	1.10
35 to 100	.80	1.0	1.15
160 to 250	.75	1.0	1.25
350 to 450	.70	1.0	1.30

Ambient Temperature	Ripple Multiplier
+85°C	1.00
+75°C	1.14
+65°C	1.25

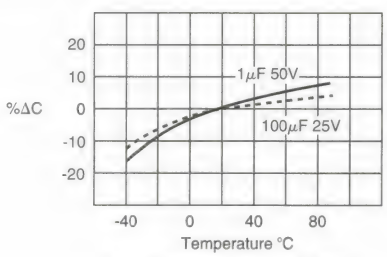
Outline Dimensions
(Millimeters)



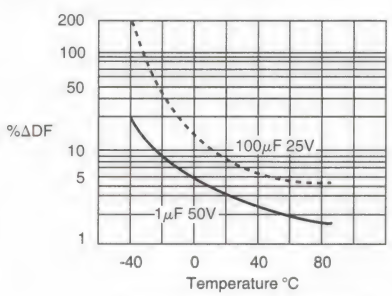
Case vented on diameters 6.3 and greater

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length

Temperature Characteristics

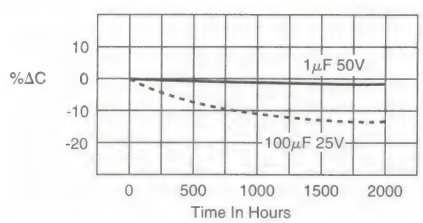


Capacitance Change Ratio

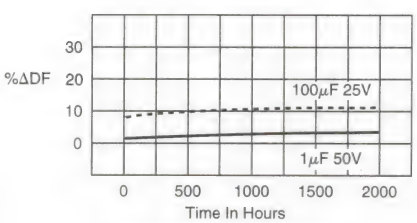


Dissipation Factor Change

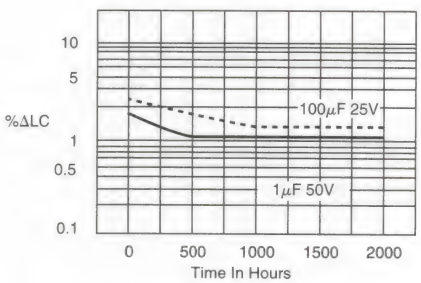
Load Life Characteristics



Capacitance Change Ratio



Dissipation Factor Change



Leakage Current Change

Aluminum Capacitors

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type SK
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
6.3 WVDC; 8 VDC Surge									
100	2.92	130	6.3	5	11	2	0.5	SK101M6R3ST	SKR101M0JD11
220	1.33	240	13.9	6.3	11	2.5	0.5	SK221M6R3ST	SKR221M0JE11V
330	0.88	300	20.8	6.3	11	2.5	0.5	SK331M6R3ST	SKR331M0JE11V
470	0.62	380	29.6	8	11.5	3.5	0.6	SK471M6R3ST	SKR471M0JF11V
1,000	0.29	580	63.0	10	13	5	0.6	SK102M6R3ST	SKR102M0JG13V
2,200	0.14	1050	138.6	10	21	5	0.6	SK222M6R3ST	SKR222M0JG21V
3,300	0.10	1250	207.9	13	21	5	0.6	SK332M6R3ST	SKR332M0JJ21V
4,700	0.08	1700	296.1	13	26	5	0.6	SK472M6R3ST	SKR472M0JJ26V
6,800	0.07	1900	428.4	16	25	7.5	0.8	SK682M6R3ST	SKR682M0JK25V
10,000	0.05	2250	630.0	16	32	7.5	0.8	SK103M6R3ST	SKR103M0JK32V
15,000	0.04	2680	945.0	18	35	7.5	0.8	SK153M6R3ST	SKR153M0JL35V
10 WVDC; 13 VDC Surge									
33	7.64	80	3.3	5	11	2	0.5	SK330M010ST	SKR330M1AD11
47	5.36	95	4.7	5	11	2	0.5	SK470M010ST	SKR470M1AD11
100	2.52	180	10.0	5	11	2	0.5	SK101M010ST	SKR101M1AD11
220	1.15	250	22.0	6.3	11	2.5	0.5	SK221M010ST	SKR221M1AE11V
330	0.76	330	33.0	8	11	3.5	0.6	SK331M010ST	SKR331M1AF11V
470	0.54	400	47.0	8	11	3.5	0.6	SK471M010ST	SKR471M1AF11V
1,000	0.25	630	100.0	10	16	5	0.6	SK102M010ST	SKR102M1AG16V
2,200	0.14	1100	220.0	10	21	5	0.6	SK222M010ST	SKR222M1AJ21V
3,300	0.10	1400	330.0	13	21	5	0.6	SK332M010ST	SKR332M1AJ21V
4,700	0.08	1800	470.0	16	25	7.5	0.8	SK472M010ST	SKR472M1AK25V
6,800	0.07	2150	680.0	16	32	7.5	0.8	SK682M010ST	SKR682M1AK32V
10,000	0.05	2500	1000.0	18	35	7.5	0.8	SK103M010ST	SKR103M1AL35V
15,000	0.04	2950	1500.0	18	42	7.5	0.8	SK153M010ST	SKR153M1AL42V
16 WVDC; 20 VDC Surge									
22	9.65	75	3.5	5	11	2	0.5	SK220M016ST	SKR220M1CD11
33	6.43	110	5.3	5	11	2	0.5	SK330M016ST	SKR330M1CD11
47	4.52	130	7.5	5	11	2	0.5	SK470M016ST	SKR470M1CD11
100	2.12	185	16.0	6.3	11	2.5	0.5	SK101M016ST	SKR101M1CE11V
220	0.97	320	35.2	8	11.5	3.5	0.6	SK221M016ST	SKR221M1CF11V
330	0.64	360	52.8	8	11.5	3.5	0.6	SK331M016ST	SKR331M1CF11V
470	0.45	470	75.2	10	13	5	0.6	SK471M016ST	SKR471M1CG13V
1,000	0.21	790	160.0	10	21	5	0.6	SK102M016ST	SKR102M1CG21V
2,200	0.14	1350	352.0	13	21	5	0.6	SK222M016ST	SKR222M1CJ21V
3,300	0.10	1700	528.0	13	26	5	0.6	SK332M016ST	SKR332M1CJ26V
4,700	0.08	2100	752.0	16	32	7.5	0.8	SK472M016ST	SKR472M1CK32V
6,800	0.07	2500	1088.0	18	35	7.5	0.8	SK682M016ST	SKR682M1CL35V
10,000	0.05	2700	1600.0	18	42	7.5	0.8	SK103M016ST	SKR103M1CL42V
25 WVDC; 32 VDC Surge									
10	18.57	50	3.0	5	11	2	0.5	SK100M025ST	SKR100M1ED11
22	8.44	90	5.5	5	11	2	0.5	SK220M025ST	SKR220M1ED11
33	5.63	110	8.3	5	11	2	0.5	SK330M025ST	SKR330M1ED11
47	3.95	130	11.8	5	11	2	0.5	SK470M025ST	SKR470M1ED11
100	1.85	185	25.0	6.3	11	2.5	0.5	SK101M025ST	SKR101M1EE11V

Type SK
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
25 WVDC; 32 VDC Surge									
220	0.84	320	55.0	8	11.5	3.5	0.6	SK221M025ST	SKR221M1EF11V
330	0.56	420	82.5	10	13	5	0.6	SK331M025ST	SKR331M1EG13V
470	0.39	540	117.5	10	16	5	0.6	SK471M025ST	SKR471M1EG16V
1,000	0.18	950	250.0	13	21	5	0.6	SK102M025ST	SKR102M1EJ21V
2,200	0.14	1550	550.0	13	26	5	0.6	SK222M025ST	SKR222M1EJ26V
3,300	0.10	1950	825.0	16	32	7.5	0.8	SK332M025ST	SKR332M1EK32V
4,700	0.08	2360	1175.0	18	35	7.5	0.8	SK472M025ST	SKR472M1EL35V
6,800	0.06	2550	1700.0	18	42	7.5	0.8	SK682M025ST	SKR682M1EL42V
35 WVDC; 44 VDC Surge									
10	15.92	60	3.5	5	11	2	0.5	SK100M035ST	SKR100M1VD11
22	7.23	95	7.7	5	11	2	0.5	SK220M035ST	SKR220M1VD11
33	4.82	115	11.6	5	11	2	0.5	SK330M035ST	SKR330M1VD11
47	3.38	140	16.5	6.3	11	2.5	0.5	SK470M035ST	SKR470M1VE11V
100	1.59	230	35.0	8	11.5	3.5	0.6	SK101M035ST	SKR101M1VF11V
220	0.72	370	77.0	10	13	5	0.6	SK221M035ST	SKR221M1VG13V
330	0.48	490	115.5	10	16	5	0.6	SK331M035ST	SKR331M1VG16V
470	0.33	640	164.5	10	21	5	0.6	SK471M035ST	SKR471M1VG21V
1,000	0.15	1100	350.0	13	21	5	0.6	SK102M035ST	SKR102M1VJ21V
2,200	0.14	1800	770.0	16	32	7.5	0.8	SK222M035ST	SKR222M1VK32V
3,300	0.10	2220	1155.0	18	35	7.5	0.8	SK332M035ST	SKR332M1VL35V
4,700	0.08	2400	1645.0	18	42	7.5	0.8	SK472M035ST	SKR472M1VL42V
50 WVDC; 63 VDC Surge									
0.47	282.33	5	3.0	5	11	2	0.5	SKR47M050ST	SKRR47M1HD11
1	132.70	10	3.0	5	11	2	0.5	SK010M050ST	SKR010M1HD11
2.2	60.32	23	3.0	5	11	2	0.5	SK2R2M050ST	SKR2R2M1HD11
3.3	40.21	35	3.0	5	11	2	0.5	SK3R3M050ST	SKR3R3M1HD11
4.7	28.23	40	3.0	5	11	2	0.5	SK4R7M050ST	SKR4R7M1HD11
10	13.27	65	5.0	5	11	2	0.5	SK100M050ST	SKR100M1HD11
22	6.03	100	11.0	5	11	2	0.5	SK220M050ST	SKR220M1HD11
33	4.02	125	16.5	6.3	11	2.5	0.5	SK330M050ST	SKR330M1HE11V
47	2.82	150	23.5	6.3	11	2.5	0.5	SK470M050ST	SKR470M1HE11V
100	1.33	250	50.0	8	11	3.5	0.6	SK101M050ST	SKR101M1HF11V
220	0.60	440	110.0	10	16	5	0.6	SK221M050ST	SKR221M1HG16V
330	0.40	580	165.0	10	16	5	0.6	SK331M050ST	SKR331M1HG21V
470	0.28	760	235.0	13	21	5	0.6	SK471M050ST	SKR471M1HJ21V
1,000	0.13	1350	500.0	16	25	5	0.8	SK102M050ST	SKR102M1HK25V
2,200	0.14	2090	1100.0	18	35	7.5	0.8	SK222M050ST	SKR222M1HL35V
3,300	0.10	2320	1650.0	18	42	7.5	0.8	SK332M050ST	SKR332M1HL42V
63 WVDC; 79 VDC Surge									
0.47	254.10	5	3.0	5	11	2	0.5	SKR47M063ST	SKRR47M1JD11
1	119.43	10	3.0	5	11	2	0.5	SK010M063ST	SKR010M1JD11
2.2	54.28	29	3.0	5	11	2	0.5	SK2R2M063ST	SKR2R2M1JD11
3.3	36.19	40	3.0	5	11	2	0.5	SK3R3M063ST	SKR3R3M1JD11
4.7	25.41	45	3.0	5	11	2	0.5	SK4R7M063ST	SKR4R7M1JD11
10	11.94	70	6.3	5	11	2	0.5	SK100M063ST	SKR100M1JD11

Type SK
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
63 WVDC; 79VDC Surge									
22	5.43	115	13.9	6.3	11	2.5	0.5	SK220M063ST	SKR220M1JE11V
33	3.62	140	20.8	6.3	11	2.5	0.5	SK330M063ST	SKR330M1JE11V
47	2.54	190	29.6	8	11	3.5	0.6	SK470M063ST	SKR470M1JF11V
100	1.19	300	63.0	10	13	5	0.6	SK101M063ST	SKR101M1JG13V
220	0.54	490	138.6	10	21	5	0.6	SK221M063ST	SKR221M1JG21V
330	0.36	680	207.9	13	21	5	0.6	SK331M063ST	SKR331M1JJ21V
470	0.25	880	296.1	13	26	5	0.6	SK471M063ST	SKR471M1JJ26V
1,000	0.12	1550	630.0	16	32	7.5	0.8	SK102M063ST	SKR102M1JK32V
100 WVDC; 125 VDC Surge									
0.47	225.87	10	3.0	5	11	2	0.5	SKR47M100ST	SKRR47M2AD11
1	106.16	21	3.0	5	11	2	0.5	SK010M100ST	SKR010M2AD11
2.2	48.25	30	3.0	5	11	2	0.5	SK2R2M100ST	SKR2R2M2AD11
3.3	32.17	40	3.3	5	11	2	0.5	SK3R3M100ST	SKR3R3M2AD11
4.7	22.59	50	4.7	5	11	2	0.5	SK4R7M100ST	SKR4R7M2AD11
10	10.62	75	10.0	6.3	11	2.5	0.5	SK100M100ST	SKR100M2AE11V
22	4.83	130	22.0	8	11	3.5	0.6	SK220M100ST	SKR220M2AF11V
33	3.22	170	33.0	10	13	5	0.6	SK330M100ST	SKR330M2AG13V
47	2.26	230	47.0	10	16	5	0.6	SK470M100ST	SKR470M2AG16V
100	1.06	400	100.0	13	21	5	0.6	SK101M100ST	SKR101M2AJ21V
220	0.48	710	220.0	16	25	7.5	0.8	SK221M100ST	SKR221M2AK25V
330	0.32	860	330.0	16	25	7.5	0.8	SK331M100ST	SKR331M2AK25V
470	0.23	1100	470.0	16	32	7.5	0.8	SK471M100ST	SKR471M2AK32V
160 WVDC; 200VDC Surge									
0.47	423.50	12	12.3	6.3	11	2.5	0.5	SKR47M160ST	SKRR47M2CE11V
1	199.04	17	14.8	6.3	11	2.5	0.5	SK010M160ST	SKR010M2CE11V
2.2	90.47	26	20.6	6.3	11	2.5	0.5	SK2R2M160ST	SKR2R2M2CE11V
3.3	60.32	35	25.8	6.3	11	2.5	0.5	SK3R3M160ST	SKR3R3M2CE11V
4.7	42.35	40	32.6	6.3	11	2.5	0.5	SK4R7M160ST	SKR4R7M2CE11V
10	19.90	65	58.0	8	11	3.5	0.5	SK100M160ST	SKR100M2CF11V
22	9.05	110	115.6	10	16	5	0.6	SK220M160ST	SKR220M2CG16V
33	6.03	150	168.4	10	21	5	0.6	SK330M160ST	SKR330M2CG21V
47	4.23	180	235.6	13	21	5	0.6	SK470M160ST	SKR470M2CJ21V
100	1.99	300	490.0	13	26	5	0.6	SK101M160ST	SKR101M2CJ26V
220	0.90	510	1066.0	16	36	7.5	0.8	SK221M160ST	SKR221M2CK35V
330	0.60	600	1594.0	18	42	7.5	0.8	SK331M160ST	SKR331M2CL42V
200 WVDC; 250VDC Surge									
0.47	423.50	12	12.8	6.3	11	2.5	0.5	SKR47M200ST	SKRR47M2DE11V
1	199.04	17	16.0	6.3	11	2.5	0.5	SK010M200ST	SKR010M2DE11V
2.2	90.47	26	23.2	6.3	11	2.5	0.5	SK2R2M200ST	SKR2R2M2DE11V
3.3	60.32	35	29.8	6.3	11	2.5	0.5	SK3R3M200ST	SKR3R3M2DE11V
4.7	42.35	45	38.2	8	11	3.5	0.6	SK4R7M200ST	SKR4R7M2DF11V
10	19.90	70	70.0	10	13	5	0.6	SK100M200ST	SKR100M2DG13V
22	9.05	110	142.0	10	21	5	0.6	SK220M200ST	SKR220M2DG21V
33	6.03	160	208.0	13	21	5	0.6	SK330M200ST	SKR330M2DJ21V
47	4.23	180	292.0	13	21	5	0.6	SK470M200ST	SKR470M2DJ21V

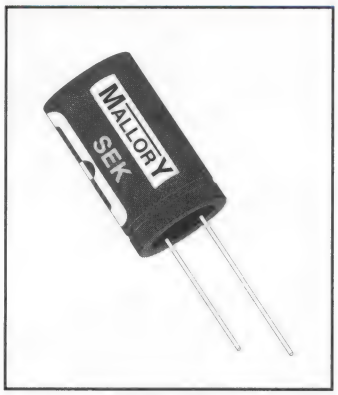
Type SK
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
200 WVDC; 250VDC Surge									
100	1.99	330	610.0	16	25	7.5	0.8	SK101M200ST	SKR101M2DK25V
220	0.90	520	1330.0	18	42	7.5	0.8	SK221M200ST	SKR221M2DL42V
250 WVDC; 300 VDC Surge									
0.47	423.50	12	13.5	6.3	11	2.5	0.5	SKR47M250ST	SKRR47M2EE11V
1	199.04	17	17.5	6.3	11	2.5	0.5	SK010M250ST	SKR010M2EE11V
2.2	90.47	30	26.5	6.3	11	2.5	0.5	SK2R2M250ST	SKR2R2M2EE11V
3.3	60.32	35	34.8	8	11	3.5	0.6	SK3R3M250ST	SKR3R3M2EF11V
4.7	42.35	45	45.3	8	11	3.5	0.6	SK4R7M250ST	SKR4R7M2EF11V
10	19.90	70	85.0	10	16	5	0.6	SK100M250ST	SKR100M2EG16V
22	9.05	130	175.0	13	21	5	0.6	SK220M250ST	SKR220M2EJ21V
33	6.03	160	257.5	13	21	5	0.6	SK330M250ST	SKR330M2EJ21V
47	4.23	210	362.5	13	26	5	0.6	SK470M250ST	SKR470M2EJ26V
100	1.99	310	760.0	16	32	7.5	0.8	SK101M250ST	SKR101M2EK32V
350 WVDC; 400 VDC Surge									
0.47	564.67	14	14.9	8	11	3.5	0.6	SKR47M350ST	SKRR47M2VF11V
1	265.39	18	20.5	8	11	3.5	0.6	SK010M350ST	SKR010M2VF11V
2.2	120.63	28	33.1	8	11	3.5	0.6	SK2R2M350ST	SKR2R2M2VF11V
3.3	80.42	35	44.7	10	13	5	0.6	SK3R3M350ST	SKR3R3M2VG13V
4.7	56.47	40	59.4	10	13	5	0.6	SK4R7M350ST	SKR4R7M2VG13V
10	26.54	70	115.0	10	21	5	0.6	SK100M350ST	SKR100M2VG21V
22	12.06	110	241.0	13	21	5	0.6	SK220M350ST	SKR220M2VJ21V
33	8.04	140	356.5	13	26	5	0.6	SK330M350ST	SKR330M2VJ26V
47	5.65	220	503.5	16	25	7.5	0.8	SK470M350ST	SKR470M2VK25V
100	2.65	360	1060.0	18	36	7.5	0.8	SK101M350ST	SKR101M2VL35V
400 WVDC; 450VDC Surge									
0.47	564.67	14	15.6	8	11	3.5	0.6	SKR47M400ST	SKRR47M2GF11V
1	265.39	18	22.0	8	11	3.5	0.6	SK010M400ST	SKR010M2GF11V
2.2	120.63	28	36.4	8	11	3.5	0.6	SK2R2M400ST	SKR2R2M2GF11V
3.3	80.42	32	49.6	10	13	5	0.6	SK3R3M400ST	SKR3R3M2GG13V
4.7	56.47	41	66.4	10	16	5	0.6	SK4R7M400ST	SKR4R7M2GG16V
10	26.54	70	130.0	13	21	5	0.6	SK100M400ST	SKR100M2GJ21V
22	12.06	120	274.0	13	26	5	0.6	SK220M400ST	SKR220M2GJ26V
33	8.04	140	406.0	16	25	7.5	0.8	SK330M400ST	SKR330M2GK25V
47	5.65	160	574.0	16	32	7.5	0.8	SK470M400ST	SKR470M2GK32V
450 WVDC; 500VDC Surge									
0.47	564.67	14	16.3	8	11	3.5	0.6	SKR47M450ST	SKRR47M2WF11V
1	265.39	19	23.5	8	11.5	3.5	0.6	SK010M450ST	SKR010M2WF11V
2.2	120.63	29	39.7	10	13	5	0.6	SK2R2M450ST	SKR2R2M2WG13V
3.3	80.42	35	54.6	10	16	5	0.6	SK3R3M450ST	SKR3R3M2WG16V
4.7	56.47	50	73.5	10	18	5	0.6	SK4R7M450ST	SKR4R7M2WG18V
10	26.54	75	145.0	13	21	5	0.6	SK100M450ST	SKR100M2WJ21V
22	12.06	110	307.0	16	25	7.5	0.8	SK220M450ST	SKR220M2WK25V
33	8.04	150	455.5	16	36	7.5	0.8	SK330M450ST	SKR330M2WK32V
47	5.65	230	644.5	18	40	7.5	0.8	SK470M450ST	SKR470M2WL35V

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type SEK
Radial Leaded Capacitors



- 105°C - Long Life
- High CV Product
- High Reliability
- Ideal for High Density Printed Circuit Boards
- Very High Volumetric Efficiency
- Suitable for General Purpose Applications, Coupling, Decoupling, Bypass and Filtering Circuits

SEK parts are available taped in Ammo pack and taped and reeled. See page 124 for details.

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +105°C

Voltage Range:
6.3 WVDC to 450 WVDC

Capacitance Range:
0.47 μF to 15,000 μF

Capacitance Tolerance:
±20%

DC Leakage Current:
6.3 - 250VDC
I = .001CV + 3μA Max
after 2 minutes application of DC working voltage at 25°C

Over 350VDC
I = .03CV + 10μA Max
after 2 minutes application of DC working voltage at 25°C

C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVDC for 1,000 hrs at 105°C
- Capacitance change 20% of initial limits
- DC leakage current meets initial limits
- ESR ≤200% of initial measured value

Shelf Life:
500 hours; no voltage applied
- Capacitor change within 20% of initial values
- Dissipation factor not exceed 200% of initial requirements
- Leakage current: not exceed 200% of initial requirement

Dissipation Factor @ 120Hz, 25°C											
WV (V)	6.3	10	16	25	35	50	63	80	100	160-250	350-400
DF(%)	26	22	18	16	14	12	10	10	10	15	20

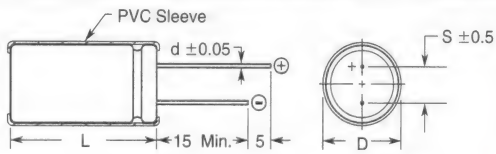
For capacitors whose capacitance value exceeds 1000μF, the value of DF(%) is increased 2% for every additional 1000μF.

The maximum ripple current at 105°C and 120 Hz for SEK capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers			
	60Hz	120Hz	1kHz	10kHz
6 to 25	.80	1.0	1.10	1.20
35 to 100	.75	1.0	1.30	1.40
160 to 250	.70	1.0	1.40	1.60
350 to 400	.60	1.0	1.50	1.80

Ambient Temperature	Ripple Multiplier
+105°C	1.00
+85°C	1.50
+70°C	1.80

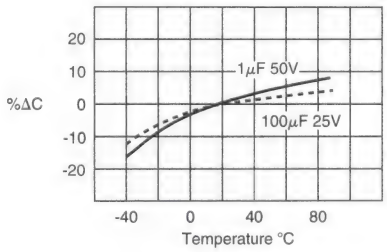
Outline Dimensions
(Millimeters)



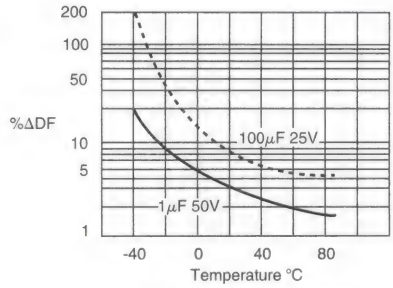
Case vented on diameters 6.3 and greater

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length

Temperature Characteristics

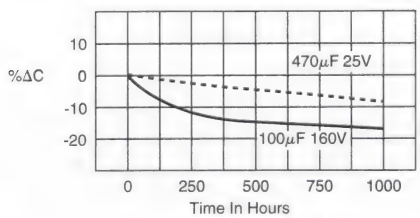


Capacitance Change Ratio

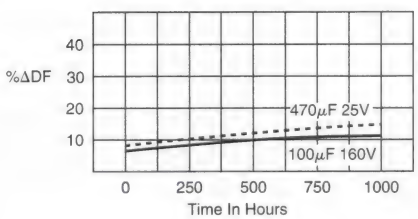


Dissipation Factor Change

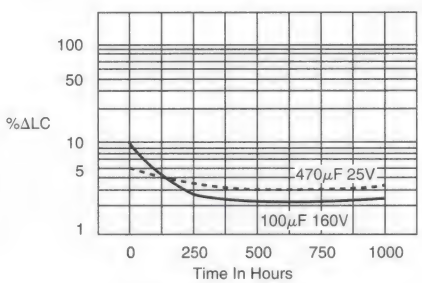
Load Life Characteristics



Capacitance Change Ratio



Dissipation Factor Change



Leakage Current Change

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
6.3 WVDC; 8 VDC Surge									
100	3.45	100	9.3	5	11	2	0.5	SEK101M6R3ST	TKR101M0JD11
220	1.57	165	16.9	6.3	11	2.5	0.5	SEK221M6R3ST	TKR221M0JE11V
330	1.05	200	23.8	6.3	11.5	2.5	0.5	SEK331M6R3ST	TKR331M0JE11V
470	0.73	280	32.6	8	11.5	3.5	0.6	SEK471M6R3ST	TKR471M0JF11V
1000	0.35	470	66.0	10	13	5	0.6	SEK102M6R3ST	TKR102M0JG13V
2200	0.17	930	141.6	10	21	5	0.6	SEK222M6R3ST	TKR222M0JG21V
3300	0.12	1100	210.9	13	21	5	0.6	SEK332M6R3ST	TKR332M0JJ21V
4700	0.10	1320	299.1	16	26	5	0.6	SEK472M6R3ST	TKR472M0JJ26V
6800	0.07	1490	431.4	16	25	7.5	0.8	SEK682M6R3ST	TKR682M0JK25V
10000	0.06	1830	633.0	16	32	7.5	0.8	SEK103M6R3ST	TKR103M0JK32V
15000	0.05	2280	948.0	18	36	7.5	0.8	SEK153M6R3ST	TKR153M0JL35V
10 WVDC; 13 VDC Surge									
47	6.21	75	7.7	5	11	2	0.5	SEK470M010ST	TKR470M1AD11
100	2.92	110	13.0	5	11	2	0.5	SEK101M010ST	TKR101M1AD11
220	1.33	180	25.0	6.3	11	2.5	0.5	SEK221M010ST	TKR221M1AE11V
330	0.88	255	36.0	8	11.5	3.5	0.6	SEK331M010ST	TKR331M1AF11V
470	0.62	305	50.0	8	11.5	3.5	0.6	SEK471M010ST	TKR471M1AF11V
1000	0.29	570	103.0	10	16	5	0.6	SEK102M010ST	TKR102M1AG16V
2200	0.14	1010	223.0	13	21	5	0.6	SEK222M010ST	TKR222M1AJ21V
3300	0.10	1220	333.0	13	25	5	0.6	SEK332M010ST	TKR332M1AJ21V
4700	0.08	1410	473.0	16	25	7.5	0.8	SEK472M010ST	TKR472M1AK25V
6800	0.07	1610	683.0	16	32	7.5	0.8	SEK682M010ST	TKR682M1AK32V
10000	0.05	1980	1003.0	18	36	7.5	0.8	SEK103M010ST	TKR103M1AL35V
15000	0.04	3330	1503.0	18	42	7.5	0.8	SEK153M010ST	TKR153M1AL42V
16 WVDC; 20 VDC Surge									
33	7.24	70	8.3	5	11	2	0.5	SEK330M016ST	TKR330M1CD11
47	5.08	85	10.5	5	11	2	0.5	SEK470M016ST	TKR470M1CD11
100	2.39	135	19.0	6.3	11	2.5	0.5	SEK101M016ST	TKR101M1CE11V
220	1.09	235	38.2	8	11.5	3.5	0.6	SEK221M016ST	TKR221M1CF11V
330	0.72	285	55.8	8	11	3.5	0.6	SEK331M016ST	TKR331M1CF11V
470	0.51	395	78.2	10	13	5	0.6	SEK471M016ST	TKR471M1CG13V
1000	0.24	700	163.0	10	21	5	0.6	SEK102M016ST	TKR102M1CG21V
2200	0.12	1150	355.0	13	21	5	0.6	SEK222M016ST	TKR222M1CJ21V
3300	0.09	1350	531.0	13	26	5	0.6	SEK332M016ST	TKR332M1CJ26V
4700	0.07	1560	755.0	16	32	7.5	0.8	SEK472M016ST	TKR472M1CK32V
6800	0.06	1790	1091.0	18	36	7.5	0.8	SEK682M016ST	TKR682M1CL35V
10000	0.05	2884	1603.0	18	42	7.5	0.8	SEK103M016ST	TKR103M1CL42V
25 WVDC; 32 VDC Surge									
10	21.23	50	5.5	5	11	2	0.5	SEK100M025ST	TKR100M1ED11
22	9.65	60	8.5	5	11	2	0.5	SEK220M025ST	TKR220M1ED11
33	6.43	75	11.3	5	11	2	0.5	SEK330M025ST	TKR330M1ED11
47	4.52	90	14.8	5	11	2	0.5	SEK470M025ST	TKR470M1ED11
100	2.12	145	28.0	6	11	2.5	0.5	SEK101M025ST	TKR101M1EE11V
220	0.97	250	58.0	8	11	3.5	0.6	SEK221M025ST	TKR221M1EF11V
330	0.64	355	85.5	10	13	5	0.6	SEK331M025ST	TKR331M1EG13V

Type SEK
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
25 WVDC; 32 VDC Surge									
470	0.45	470	120.5	10	16	5	0.6	SEK471M025ST	TKR471M1EG16V
1000	0.21	855	253.0	13	21	5	0.6	SEK102M025ST	TKR102M1EJ21V
2200	0.11	1230	553.0	13	26	5	0.6	SEK222M025ST	TKR222M1EJ26V
3300	0.08	1450	828.0	16	32	7.5	0.8	SEK332M025ST	TKR332M1EK32V
4700	0.07	1690	1178.0	18	36	7.5	0.8	SEK472M025ST	TKR472M1EL35V
6800	0.05	2856	1703.0	18	42	7.5	0.8	SEK682M025ST	TKR682M1EL42V
35 WVDC; 44 VDC Surge									
22	8.44	65	10.7	5	11	2	0.5	SEK220M035ST	TKR220M1VD11
33	5.63	85	14.6	5	11	2	0.5	SEK330M035ST	TKR330M1VD11
47	3.95	115	19.5	6.3	11	2.5	0.5	SEK470M035ST	TKR470M1VE11V
100	1.86	190	38.0	8	11.5	3.5	0.6	SEK101M035ST	TKR101M1VF11V
220	0.84	315	80.0	10	13	5	0.6	SEK221M035ST	TKR221M1VG13V
330	0.56	440	118.5	10	16	5	0.6	SEK331M035ST	TKR331M1VG16V
470	0.40	580	167.5	13	20	5	0.6	SEK471M035ST	TKR471M1VG21V
1000	0.19	995	353.0	13	21	5	0.6	SEK102M035ST	TKR102M1VJ21V
2200	0.10	1450	773.0	16	32	7.5	0.8	SEK222M035ST	TKR222M1VK32V
3300	0.07	1660	1158.0	18	36	7.5	0.8	SEK332M035ST	TKR332M1VL35V
4700	0.06	2674	1648.0	18	42	7.5	0.8	SEK472M035ST	TKR472M1VL42V
50 WVDC; 63 VDC Surge									
0.47	338.80	7	3.2	5	11	2	0.5	SEKR47M050ST	TKRR47M1HD11
1	159.24	12	3.5	5	11	2	0.5	SEK010M050ST	TKR010M1HD11
2.2	72.38	18	4.1	5	11	2	0.5	SEK2R2M050ST	TKR2R2M1HD11
3.3	48.25	25	4.7	5	11	2	0.5	SEK3R3M050ST	TKR3R3M1HD11
4.7	33.88	30	5.4	5	11	2	0.5	SEK4R7M050ST	TKR4R7M1HD11
10	15.92	50	8.0	5	11	2	0.5	SEK100M050ST	TKR100M1HD11
22	7.24	75	14.0	5	11	2	0.5	SEK220M050ST	TKR220M1HD11
33	4.83	105	19.5	6.3	11	2.5	0.5	SEK330M050ST	TKR330M1HE11V
47	3.39	125	26.5	6.3	11.5	2.5	0.5	SEK470M050ST	TKR470M1HE11V
100	1.59	210	53.0	8	11	3.5	0.6	SEK101M050ST	TKR101M1HF11V
220	0.72	400	113.0	10	16	5	0.6	SEK221M050ST	TKR221M1HG16V
330	0.48	535	168.0	10	21	5	0.6	SEK331M050ST	TKR331M1HG21V
470	0.34	730	238.0	13	21	5	0.6	SEK471M050ST	TKR471M1HJ21V
1000	0.16	1110	503.0	16	25	7.5	0.8	SEK102M050ST	TKR102M1HK25V
2200	0.08	1530	1103.0	18	36	7.5	0.8	SEK222M050ST	TKR222M1HL35V
3300	0.47	2478	1653.0	18	42	7.5	0.8	SEK332M050ST	TKR332M1HL42V
63 WVDC; 79 VDC Surge									
4.7	28.23	34	6.0	5	11	2	0.5	SEK4R7M063ST	TKR4R7M1JD11
10	13.27	55	9.3	5	11	2	0.5	SEK100M063ST	TKR100M1JD11
22	6.03	90	16.9	6.3	11	2.5	0.5	SEK220M063ST	TKR220M1JE11V
33	4.02	110	23.8	6.3	11	2.5	0.5	SEK330M063ST	TKR330M1JE11V
47	2.82	155	32.6	8	11	3.5	0.6	SEK470M063ST	TKR470M1JF11V
100	1.33	260	66.0	10	13	5	0.6	SEK101M063ST	TKR101M1JG13V
220	0.60	460	141.6	10	21	5	0.6	SEK221M063ST	TKR221M1JG21V
330	0.40	650	210.9	13	21	5	0.6	SEK331M063ST	TKR331M1JJ21V
470	0.28	800	299.1	13	26	5	0.6	SEK471M063ST	TKR471M1JJ26V
1000	0.13	1200	633.0	16	32	7.5	0.8	SEK102M063ST	TKR102M1JK32V

Type SEK
Radial Leaded Capacitors

MALLORY

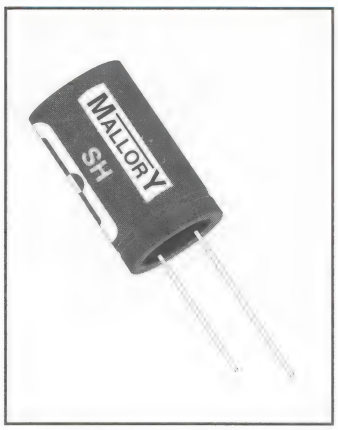
Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
100 WVDC; 125 VDC Surge									
0.47	282.33	10	3.5	5	11	2	0.5	SEKR47M100ST	TKRR47M2AD11
1	132.70	15	4.0	5	11	2	0.5	SEK010M100ST	TKR010M2AD11
2.2	60.32	22	5.2	5	11	2	0.5	SEK2R2M100ST	TKR2R2M2AD11
3.3	40.21	29	6.3	5	11	2	0.5	SEK3R3M100ST	TKR3R3M2AD11
4.7	28.23	37	7.7	5	11	2	0.5	SEK4R7M100ST	TKR4R7M2AD11
10	13.27	65	13.0	6.3	11	2.5	0.5	SEK100M100ST	TKR100M2AE11V
22	6.03	115	25.0	8	11	3.5	0.6	SEK220M100ST	TKR220M2AF11V
33	4.02	160	36.0	10	13	5	0.6	SEK330M100ST	TKR330M2AG13V
47	2.82	210	50.0	10	16	5	0.6	SEK470M100ST	TKR470M2AG16V
100	1.33	385	103.0	13	20	5	0.6	SEK101M100ST	TKR101M2AJ21V
220	0.60	590	223.0	16	25	7.5	0.8	SEK221M100ST	TKR221M2AK25V
330	0.40	720	333.0	16	25	7.5	0.8	SEK331M100ST	TKR331M2AK25V
470	0.28	875	473.0	16	32	7.5	0.8	SEK471M100ST	TKR471M2AK32V
160 WVDC; 200 VDC Surge									
0.47	423.50	12	12.3	6.3	11	2.5	0.5	SEKR47M160ST	TKRR47M2CE11V
1	199.04	17	14.8	6.3	11	2.5	0.5	SEK010M160ST	TKR010M2CE11V
2.2	90.47	25	20.6	6.3	11	2.5	0.5	SEK2R2M160ST	TKR2R2M2CE11V
3.3	60.32	36	25.8	6.3	11	2.5	0.5	SEK3R3M160ST	TKR3R3M2CE11V
4.7	42.35	43	32.6	6.3	11	2.5	0.5	SEK4R7M160ST	TKR4R7M2CE11V
10	19.90	70	58.0	8	11	3.5	0.6	SEK100M160ST	TKR100M2CF11V
22	9.05	130	115.6	10	16	5	0.6	SEK220M160ST	TKR220M2CG16V
33	6.03	180	168.4	10	21	5	0.6	SEK330M160ST	TKR330M2CG21V
47	4.23	270	235.6	13	21	5	0.6	SEK470M160ST	TKR470M2CJ21V
100	1.99	330	490.0	13	26	5	0.6	SEK101M160ST	TKR101M2CJ26V
220	0.90	500	1066.0	16	35	7.5	0.8	SEK221M160ST	TKR221M2CK35V
330	0.60	850	1594.0	18	42	7.5	0.8	SEK331M160ST	TKR331M2CL42V
200 WVDC; 250 VDC Surge									
0.47	423.50	12	12.8	6.3	11	2.5	0.5	SEKR47M200ST	TKRR47M2DE11V
1	199.04	17	16.0	6.3	11	2.5	0.5	SEK010M200ST	TKR010M2DE11V
2.2	90.47	25	23.2	6.3	11.5	2.5	0.5	SEK2R2M200ST	TKR2R2M2DE11V
3.3	60.32	36	29.8	6.3	11.5	2.5	0.5	SEK3R3M200ST	TKR3R3M2DE11V
4.7	42.35	50	38.2	8	11	3.5	0.6	SEK4R7M200ST	TKR4R7M2DF11V
10	19.90	80	70.0	10	13	5	0.6	SEK100M200ST	TKR100M2DG13V
22	9.05	140	142.0	10	21	5	0.6	SEK220M200ST	TKR220M2DG21V
33	6.03	190	208.0	13	21	5	0.6	SEK330M200ST	TKR330M2DJ21V
47	4.23	220	292.0	13	21	5	0.6	SEK470M200ST	TKR470M2DJ21V
100	1.99	335	610.0	16	25	7.5	0.8	SEK101M200ST	TKR101M2DK25V
220	0.90	515	1330.0	18	42	7.5	0.8	SEK221M200ST	TKR221M2DL42V
250 WVDC; 300 VDC Surge									
0.47	423.50	12	13.5	6.3	11	2.5	0.5	SEKR47M250ST	TKRR47M2EE11V
1	199.04	17	17.5	6.3	11	2.5	0.5	SEK010M250ST	TKR010M2EE11V
2.2	90.47	29	26.5	6.3	11.5	2.5	0.5	SEK2R2M250ST	TKR2R2M2EE11V
3.3	60.32	42	34.8	8	11	3.5	0.6	SEK3R3M250ST	TKR3R3M2EF11V
4.7	42.35	50	45.3	8	11	3.5	0.6	SEK4R7M250ST	TKR4R7M2EF11V
10	19.90	88	85.0	10	16	5	0.6	SEK100M250ST	TKR100M2EG16V

Type SEK
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
250 WVDC; 300 VDC Surge									
22	9.05	155	175.0	13	21	5	0.6	SEK220M250ST	TKR220M2EJ21V
33	6.03	190	257.5	13	21	5	0.6	SEK330M250ST	TKR330M2EJ21V
47	4.23	230	362.5	13	26	5	0.6	SEK470M250ST	TKR470M2EJ26V
100	1.99	340	760.0	16	32	7.5	0.8	SEK101M250ST	TKR101M2EK32V
350 WVDC; 400 VDC Surge									
0.47	564.67	14	14.9	8	11	3.5	0.6	SEKR47M350ST	TKRR47M2VF11V
1	265.39	20	20.5	8	11	3.5	0.6	SEK010M350ST	TKR010M2VF11V
2.2	120.63	35	33.1	10	11.5	3.5	0.6	SEK2R2M350ST	TKR2R2M2VF11V
3.3	80.42	47	44.7	10	13	5	0.6	SEK3R3M350ST	TKR3R3M2VG13V
4.7	56.47	55	59.4	10	13	5	0.6	SEK4R7M350ST	TKR4R7M2VG13V
10	26.54	95	115.0	10	21	5	0.6	SEK100M350ST	TKR100M2VG21V
22	12.06	165	241.0	13	26	5	0.6	SEK220M350ST	TKR220M2VJ26V
33	8.04	195	356.5	13	25	7.5	0.8	SEK330M350ST	TKR330M2VK25V
47	5.65	240	503.5	16	35	7.5	0.8	SEK470M350ST	TKR470M2VK35V
100	2.65	360	1060.0	18	42	7.5	0.8	SEK101M350ST	TKR101M2VL42V
400 WVDC; 450 VDC Surge									
0.47	564.67	14	15.6	8	11	3.5	0.6	SEKR47M400ST	TKRR47M2GF11V
1	265.39	20	22.0	8	11	3.5	0.6	SEK010M400ST	TKR010M2GF11V
2.2	120.63	35	36.4	10	13	5	0.6	SEK2R2M400ST	TKR2R2M2GG13V
3.3	80.42	50	49.6	10	13	5	0.6	SEK3R3M400ST	TKR3R3M2GG13V
4.7	56.47	58	66.4	10	16	5	0.6	SEK4R7M400ST	TKR4R7M2GG16V
10	26.54	100	130.0	13	21	5	0.6	SEK100M400ST	TKR100M2GJ21V
22	12.06	170	274.0	13	26	5	0.6	SEK220M400ST	TKR220M2GJ26V
33	8.04	205	406.0	16	32	7.5	0.8	SEK330M400ST	TKR330M2GK32V
47	5.65	255	574.0	18	36	7.5	0.8	SEK470M400ST	TKR470M2GL35V
450 WVDC; 500 VDC Surge									
0.47	564.67	14	15.6	8	11	3.5	0.6	SEKR47M450ST	
1	265.39	20	22.0	8	11	3.5	0.6	SEK010M450ST	
2.2	120.63	35	36.4	10	13	5	0.6	SEK2R2M450ST	
3.3	80.42	50	49.6	10	13	5	0.6	SEK3R3M450ST	
4.7	56.47	58	66.4	10	16	5	0.6	SEK4R7M450ST	
10	26.54	100	130.0	13	21	5	0.6	SEK100M450ST	
22	12.06	170	274.0	13	26	5	0.6	SEK220M450ST	
33	8.04	205	406.0	16	32	7.5	0.8	SEK330M450ST	
47	5.65	255	574.0	18	36	7.5	0.8	SEK470M450ST	

Type SH
Radial Leaded Capacitors



- 105°C - Long Life
- 2000 Hour Load Life
- Suited for Very High Reliability and Quality Applications

SH parts are available taped in Ammo pack and taped and reeled. See page 124 for details.

Dissipation Factor @ 120Hz, 25°C									
WV (V)	6.3	10	16	25	35	50	63-100	160-250	400-450
DF(%)	26	22	18	16	14	12	10	15	20

For capacitors whose capacitance value exceeds 1000μF, the value of DF(%) is increased 2% for every additional 1000μF.

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +105°C
(-25°C for 160 WVDC to 350 VDC)

Voltage Range:
6.3 WVDC to 350 WVDC

Capacitance Range:
0.47 μF to 15,000 μF

Capacitance Tolerance:
±20%

DC Leakage Current:
6.3 - 100VDC
I = .01CV + 3μA Max
after 2 minutes application of DC working voltage at 25°C

Over 100VDC
I = .03CV + 10μA Max
after 2 minutes application of DC working voltage at 25°C
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVDC for 2,000 hrs
- Capacitance Change: 20% of initial limits
- DC leakage current meets initial limits
- DF ≤200% of initial value

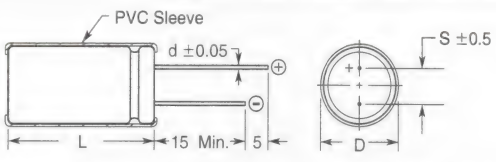
Shelf Life:
1,000 hrs - no voltage applied
- Capacitance Change: 20% from initial limits
- DC leakage not to exceed 200% of initial requirment
- DF ≤200% of initial value

The maximum ripple current at 105°C and 120 Hz for SH capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers			
	60Hz	120Hz	1kHz	10kHz
6 to 25	.80	1.0	1.10	1.20
35 to 100	.75	1.0	1.30	1.40
160 to 250	.70	1.0	1.40	1.60

Ambient Temperature	Ripple Multiplier
+105°C	1.00
+85°C	1.50
+70°C	1.80

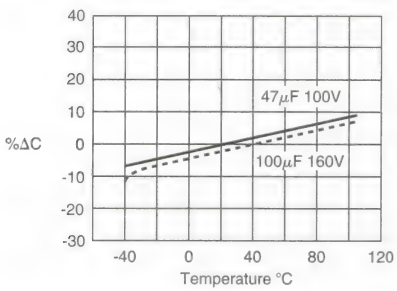
Outline Dimensions
(Millimeters)



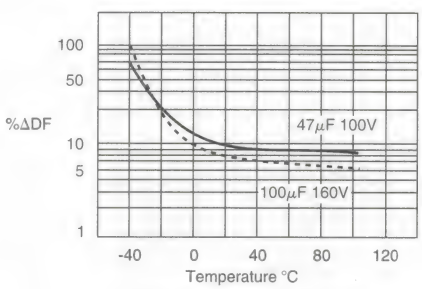
Case vented on diameters 6.3 and greater

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length

Temperature Characteristics

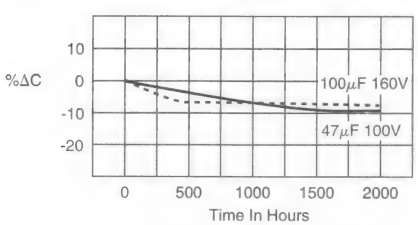


Capacitance Change Ratio

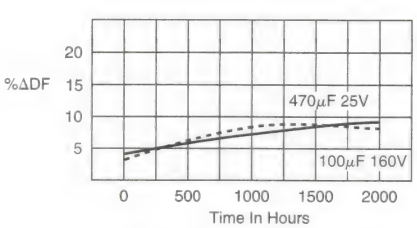


Dissipation Factor Change

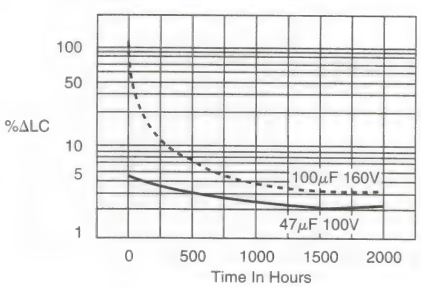
Load Life Characteristics



Capacitance Change Ratio



Dissipation Factor Change



Leakage Current Change

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type SH
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
6.3 WVDC; 8 VDC Surge									
47	7.34	65	6.0	5	11	2	0.5	SH470M6R3ST	TMR470M0JD11
100	3.45	100	9.3	5	11	2.5	0.5	SH101M6R3ST	TMR101M0JE11V
220	1.57	165	16.9	6	11	2.5	0.5	SH221M6R3ST	TMR221M0JF11V
330	1.05	200	23.8	8	11.5	3.5	0.6	SH331M6R3ST	TMR331M0JG13V
470	0.73	280	32.6	8	11.5	3.5	0.6	SH471M6R3ST	TMR471M0JG13V
1000	0.35	470	66.0	10	12	5	0.6	SH102M6R3ST	TMR102M0JG21V
2200	0.17	930	141.6	13	20	5	0.6	SH222M6R3ST	TMR222M0JJ26V
3300	0.12	1100	210.9	13	20	7.5	0.8	SH332M6R3ST	TMR332M0JK25V
4700	0.10	1320	299.1	16	25	7.5	0.8	SH472M6R3ST	TMR472M0JK32V
10 WVDC; 13 VDC Surge									
47	6.21	75	7.7	5	11	2	0.5	SH470M010ST	TMR470M1AD11
100	2.92	110	13.0	5	11	2.5	0.5	SH101M010ST	TMR101M1AE11V
220	1.33	180	25.0	6	11	2.5	0.5	SH221M010ST	TMR221M1AF11V
330	0.88	255	36.0	8	11.5	3.5	0.6	SH331M010ST	TMR331M1AG13V
470	0.62	305	50.0	8	11.5	3.5	0.6	SH471M010ST	TMR471M1AG16V
1000	0.29	570	103.0	10	16	5	0.6	SH102M010ST	TMR102M1AG21V
2200	0.14	1010	223.0	13	20	5	0.6	SH222M010ST	TMR222M1AJ26V
3300	0.91	1220	333.0	13	25	5	0.8	SH332M010ST	TMR332M1AK25V
4700	0.08	1410	473.0	16	25	7.5	0.8	SH472M010ST	TMR472M1AK32V
16 WVDC; 20 VDC Surge									
33	7.24	70	8.3	5	11	2	0.5	SH330M016ST	TMR330M1CD11
47	5.08	85	10.5	5	11	2	0.5	SH470M016ST	TMR470M1CE11V
100	2.39	135	19.0	6	11	2.5	0.5	SH101M016ST	TMR101M1CE11V
220	1.09	235	38.2	8	11.5	3.5	0.6	SH221M016ST	TMR221M1CG13V
330	0.72	285	55.8	8	11.5	3.5	0.6	SH331M016ST	TMR331M1CG16V
470	0.51	395	78.2	10	12	5	0.6	SH471M016ST	TMR471M1CG18V
1000	0.24	700	163.0	10	20	5	0.6	SH102M016ST	TMR102M1CJ21V
2200	0.12	1150	355.0	13	25	5	0.8	SH222M016ST	TMR222M1CK25V
3300	0.09	1350	531.0	16	25	7.5	0.8	SH332M016ST	TMR332M1CK32V
4700	0.36	1560	755.0	16	32	7.5	0.8	SH472M016ST	TMR472M1CL35V
25 WVDC; 32 VDC Surge									
10	21.23	39	5.5	5	11	2	0.5	SH100M025ST	TMR100M1ED11
22	9.65	60	8.5	5	11	2	0.5	SH220M025ST	TMR220M1ED11
33	6.43	75	11.3	5	11	2	0.5	SH330M025ST	TMR330M1EE11V
47	4.52	90	14.8	5	11	2	0.5	SH470M025ST	TMR470M1EE11V
100	2.12	145	28.0	6	11	2.5	0.5	SH101M025ST	TMR101M1EF11V
220	0.97	250	58.0	10	12	5	0.6	SH221M025ST	TMR221M1EG16V
330	0.64	355	85.5	10	12	5	0.6	SH331M025ST	TMR331M1EG18V
470	0.45	470	120.5	10	16	5	0.6	SH471M025ST	TMR471M1EG21V
1000	0.21	855	253.0	13	20	5	0.6	SH102M025ST	TMR102M1EJ26V
2200	0.11	1230	553.0	16	25	7.5	0.8	SH222M025ST	TMR222M1EK32V
3300	0.08	1450	828.0	16	32	7.5	0.8	SH332M025ST	TMR332M1EL35V
4700	0.07	1690	1178.0	18	36	7.5	0.8	SH472M025ST	TMR472M1EL42V

Type SH
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
35 WVDC; 44 VDC Surge									
10	18.58	40	6.5	5	11	2	0.5	SH100M035ST	TMR100M1VD11
22	8.44	65	10.7	6	11	2.5	0.5	SH220M035ST	TMR220M1VE11V
33	5.63	85	14.6	6	11	2.5	0.5	SH330M035ST	TMR330M1VE11V
47	3.95	115	19.5	6	11	3.5	0.5	SH470M035ST	TMR470M1VF11V
100	1.86	190	38.0	8	11.5	3.5	0.6	SH101M035ST	TMR101M1VG13V
220	0.84	315	80.0	10	12	5	0.6	SH221M035ST	TMR221M1VG18V
330	0.56	440	118.5	10	16	5	0.6	SH331M035ST	TMR331M1VG21V
470	0.40	580	167.5	13	20	5	0.6	SH471M035ST	TMR471M1VJ21V
1000	0.19	995	353.0	13	25	5	0.8	SH102M035ST	TMR102M1VK25V
2200	0.70	1450	773.0	16	32	7.5	0.8	SH222M035ST	TMR222M1VL35V
3300	0.07	1660	1158.0	18	36	7.5	0.8	SH332M035ST	TMR332M1VL42V
50 WVDC; 63 VDC Surge									
0.47	338.80	7	3.2	5	11	2	0.5	SHR47M050ST	TMRR47M1HD11
1	159.24	12	3.5	5	11	2	0.5	SH010M050ST	
2.2	72.38	18	4.1	5	11	2	0.5	SH2R2M050ST	TMR2R2M1HD11
3.3	48.25	25	4.7	5	11	2	0.5	SH3R3M050ST	TMR3R3M1HD11
4.7	33.88	30	5.4	5	11	2	0.5	SH4R7M050ST	TMR4R7M1HD11
10	15.92	50	8.0	5	11	2	0.5	SH100M050ST	TMR100M1HD11
22	7.24	75	14.0	5	11	2	0.5	SH220M050ST	TMR220M1HE11V
33	4.83	105	19.5	6	11	2.5	0.5	SH330M050ST	TMR330M1HF11V
47	3.39	125	26.5	8	11.5	3.5	0.5	SH470M050ST	TMR470M1HF11V
100	1.59	210	53.0	10	12	5	0.6	SH101M050ST	TMR101M1HG16V
220	0.72	400	113.0	10	16	5	0.6	SH221M050ST	TMR221M1HG21V
330	0.48	535	168.0	10	20	5	0.6	SH331M050ST	TMR331M1HJ21V
470	0.34	730	238.0	13	20	5	0.6	SH471M050ST	TMR471M1HJ26V
1000	0.16	1110	503.0	16	25	7.5	0.8	SH102M050ST	TMR102M1HK32V
2200	0.08	1530	1103.0	18	36	7.5	0.8	SH222M050ST	TMR222M1HL42V
63 WVDC; 79 VDC Surge									
4.7	28.23	34	6.0	5	11	2	0.5	SH4R7M063ST	TMR4R7M1JD11
10	13.27	55	9.3	5	11	2	0.5	SH100M063ST	TMR100M1JE11V
22	6.03	90	16.9	6	11	3.5	0.5	SH220M063ST	TMR220M1JF11V
33	4.02	110	23.8	8	11.5	3.5	0.5	SH330M063ST	TMR330M1JF11V
47	2.82	155	32.6	8	11.5	3.5	0.6	SH470M063ST	TMR470M1JG13V
100	1.33	260	66.0	10	12	5	0.6	SH101M063ST	TMR101M1JG18V
220	0.60	460	141.6	10	20	5	0.6	SH221M063ST	TMR221M1JJ21V
330	0.40	650	210.9	13	20	5	0.6	SH331M063ST	TMR331M1JJ26V
470	0.28	800	299.1	13	25	7.5	0.8	SH471M063ST	TMR471M1JK25V
1000	0.13	1200	633.0	16	32	7.5	0.8	SH102M063ST	TMR102M1JL35V
100 WVDC; 125 VDC Surge									
0.47	282.33	10	3.5	5	11	2	0.5	SHR47M100ST	TMRR47M2AD11
1	132.70	15	4.0	5	11	2	0.5	SH010M100ST	
2.2	60.32	22	5.2	5	11	2	0.5	SH2R2M100ST	TMR2R2M2AD11
3.3	40.21	29	6.3	5	11	2	0.5	SH3R3M100ST	TMR3R3M2AE11V
4.7	28.23	37	7.7	5	11	2	0.5	SH4R7M100ST	TMR4R7M2AE11V
10	13.27	65	13.0	6	11	3.5	0.5	SH100M100ST	TMR100M2AF11V

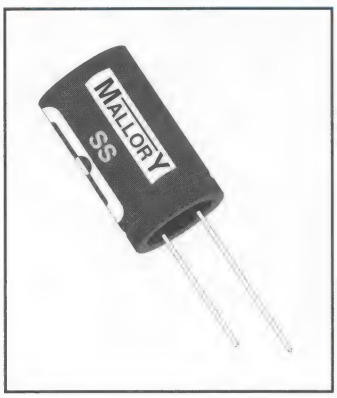
Type SH
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C*	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
100 WVDC; 125 VDC Surge									
22	6.03	115	25.0	8	11.5	3.5	0.6	SH220M100ST	TMR220M2AG13V
33	4.02	160	36.0	10	12	5	0.6	SH330M100ST	TMR330M2AG16V
47	2.82	210	50.0	10	16	5	0.6	SH470M100ST	TMR470M2AG18V
100	1.33	385	103.0	13	20	5	0.6	SH101M100ST	TMR101M2AJ21V
220	0.60	590	223.0	16	25	7.5	0.8	SH221M100ST	TMR221M2AK25V
330	0.40	720	333.0	16	25	7.5	0.8	SH331M100ST	TMR331M2AK32V
470	0.28	875	473.0	16	32	7.5	0.8	SH471M100ST	TMR471M2AL35V
*** 160 WVDC; 200 VDC Surge**									
1	199.04	17	14.8	5	11	2	0.5	SH010M160ST	
2.2	90.47	25	20.6	6	11	2.5	0.5	SH2R2M160ST	TMR2R2M2CF11V
3.3	60.32	36	25.8	8	11.5	3.5	0.6	SH3R3M160ST	TMR3R3M2CG13V
4.7	42.35	43	32.6	8	11.5	3.5	0.6	SH4R7M160ST	TMR4R7M2CG13V
10	19.90	70	58.0	10	12	5	0.6	SH100M160ST	TMR100M2CG16V
22	9.05	130	115.6	10	20	5	0.6	SH220M160ST	TMR220M2CJ21V
33	6.03	180	168.4	13	20	5	0.6	SH330M160ST	TMR330M2CJ26V
47	4.23	270	235.6	13	25	7.5	0.8	SH470M160ST	TMR470M2CK25V
100	1.99	330	490.0	16	25	7.5	0.8	SH101M160ST	TMR101M2CK32V
*** 200 WVDC; 250 VDC Surge**									
1	199.04	17	16.0	6	11	2.5	0.5	SH010M200ST	
2.2	90.47	25	23.2	8	11	3.5	0.5	SH2R2M200ST	TMR2R2M2DF11V
3.3	60.32	36	29.8	8	11.5	3.5	0.6	SH3R3M200ST	TMR3R3M2DG13V
4.7	42.35	50	38.2	10	12	5	0.6	SH4R7M200ST	TMR4R7M2DG13V
10	19.90	80	70.0	10	16	5	0.6	SH100M200ST	TMR100M2DG18V
22	9.05	140	142.0	10	20	5	0.6	SH220M200ST	TMR220M2DJ21V
33	6.03	190	208.0	13	25	5	0.6	SH330M200ST	TMR330M2DJ26V
47	4.23	220	292.0	13	25	5	0.8	SH470M200ST	TMR470M2DK25V
100	1.99	335	610.0	16	32	7.5	0.8	SH101M200ST	TMR101M2DL35V
*** 250 WVDC; 300 VDC Surge**									
1	199.04	17	17.5	6	11	3.5	0.5	SH010M250ST	
2.2	90.47	29	26.5	8	11.5	3.5	0.6	SH2R2M250ST	TMR2R2M2EG13V
3.3	60.32	42	34.8	10	12	5	0.6	SH3R3M250ST	TMR3R3M2EG13V
4.7	42.35	50	45.3	10	12	5	0.6	SH4R7M250ST	TMR4R7M2EG16V
10	19.90	88	85.0	10	20	5	0.6	SH100M250ST	TMR100M2EG21V
22	9.05	155	175.0	13	25	5	0.6	SH220M250ST	TMR220M2EJ26V
33	6.03	190	257.5	13	25	5	0.8	SH330M250ST	TMR330M2EK25V
47	4.23	230	362.5	16	25	7.5	0.8	SH470M250ST	TMR470M2EK32V
100	1.99	340	760.0	18	36	7.5	0.8	SH101M250ST	TMR101M2EL35V
*** 400 WVDC; 450 VDC Surge**									
22	12.06	110	274.0	16	25	7.5	0.8	SH220M400ST	
*** 450 WVDC; 500 VDC Surge**									
10	26.54	80	145.0	13	25	5	0.6	SH100M450ST	

* Over 160 Volts the Ripple is Measured at 85° C.

Type SS
Radial Leaded Capacitors



- 85°C - Sub-Miniature
- Radial Leads
- 4, 5 and 6.3mm Diameters 7mm Height
- Ideal For High Density Electronic Equipment, Such as Pocket Calculators, Lap-Top Computers, Car Stereos, Mini Tape Recorders and Where Space is Limited.

SS parts are available taped in Ammo pack and taped and reeled. See page 124 for details.

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
6.3 WVDC to 63 WVDC

Capacitance Range:
0.1 μF to 100 μF

Capacitance Tolerance:
±20%

DC Leakage Current:
I = .01CV or 3μA
whichever is greater after 2 minutes
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVDC for 1,000 hrs at 85°C
- Capacitance Change: 20% of initial limits
- DC leakage current meets initial limits
- ESR ≤200% of initial value

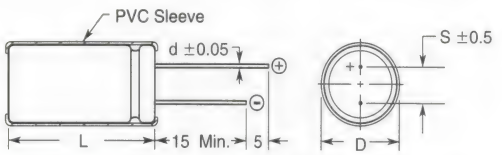
Shelf Life:
500 hrs - no voltage applied
- Capacitance Change: 20% from initial limits
- DC leakage ≤200% of initial value
- ESR ≤200% of initial value

The maximum ripple current at 85°C and 120 Hz for SS capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers		
	60Hz	120Hz	1kHz
6 to 25	.85	1.0	1.10
35 to 63	.80	1.0	1.15

Ambient Temperature	Ripple Multiplier
+85°C	1.00
+75°C	1.14
+65°C	1.25

Outline Dimensions
(Millimeters)



Case vented on diameters 6.3 and greater.

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length.

Cap μF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC μA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
6.3 WVDC; 8 VDC Surge									
22	14.48	34	3.0	4	7	1.5	0.45	SS220M6R3ST	
33	9.65	42	3.0	5	7	2	0.45	SS330M6R3ST	
47	6.78	50	3.0	5	7	2	0.45	SS470M6R3ST	
100	3.18	77	6.3	6	7	2.5	0.45	SS101M6R3ST	SSR101M0JE07V
10 WVDC; 13 VDC Surge									
22	12.06	38	3.0	5	7	2	0.45	SS220M010ST	SSR220M1AC07
33	8.04	47	3.3	5	7	2	0.45	SS330M010ST	SSR330M1AC07
47	5.65	59	4.7	6	7	2.5	0.45	SS470M010ST	SSR470M1AD07
100	2.65	80	10.0	6	7	2.5	0.45	SS101M010ST	SSR101M1AE07V
16 WVDC; 20 VDC Surge									
10	22.56	29	3.0	4	7	1.5	0.45	SS100M016ST	SSR100M1CC07
22	10.25	44	3.5	5	7	2	0.45	SS220M016ST	SSR220M1CC07
33	6.84	57	5.3	5	7	2	0.45	SS330M016ST	SSR330M1CD07
47	4.80	68	7.5	6	7	2.5	0.45	SS470M016ST	SSR470M1CE07V
25 WVDC; 32 VDC Surge									
4.7	42.35	24	3.0	4	7	1.5	0.45	SS4R7M025ST	
10	19.90	33	3.0	5	7	2	0.45	SS100M025ST	SSR100M1EC07
22	9.05	51	5.5	6	7	2.5	0.45	SS220M025ST	SSR220M1ED07
33	6.03	63	8.3	6	7	2.5	0.45	SS330M025ST	SSR330M1EE07V
47	4.23	71	11.8	6	7	2.5	0.45	SS470M025ST	

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

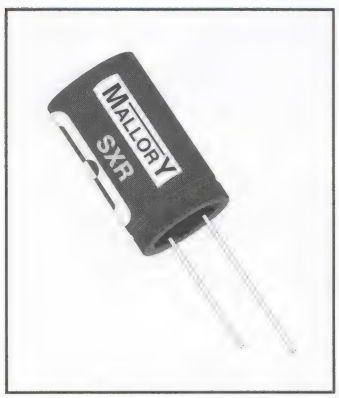
Type SS
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
35 WVDC; 44 VDC Surge									
4.7	33.88	24	3.0	4	7	1.5	0.45	SS4R7M035ST	
10	15.92	36	3.5	5	7	2	0.45	SS100M035ST	SSR100M1VD07
22	7.24	57	7.7	6	7	2.5	0.45	SS220M035ST	SSR220M1VE07V
50 WVDC; 63 VDC Surge									
0.1	1326.96	1	3.0	4	7	1.5	0.45	SSR10M050ST	SSR0R1M1HC07
0.22	603.17	2	3.0	4	7	1.5	0.45	SSR22M050ST	SSRR22M1HC07
0.33	402.11	3	3.0	4	7	1.5	0.45	SSR33M050ST	SSRR33M1HC07
0.47	282.33	5	3.0	4	7	1.5	0.45	SSR47M050ST	SSRR47M1HC07
1	132.70	10	3.0	4	7	1.5	0.45	SS010M050ST	SSR010M1HC07
2.2	60.32	19	3.0	4	7	1.5	0.45	SS2R2M050ST	SSR2R2M1HC07
3.3	40.21	24	3.0	4	7	1.5	0.45	SS3R3M050ST	SSR3R3M1HC07
4.7	28.23	29	3.0	5	7	2	0.45	SS4R7M050ST	SSR4R7M1HC07
10	13.27	44	5.0	6	7	2.5	0.45	SS100M050ST	SSR100M1HE07V
63 WVDC; 79 VDC Surge									
0.1	1061.57	1	3.0	4	7	1.5	0.45	SSR10M063ST	SSR0R1M1JC07
0.22	482.53	2	3.0	4	7	1.5	0.45	SSR22M063ST	SSRR22M1JC07
0.33	321.69	4	3.0	4	7	1.5	0.45	SSR33M063ST	SSRR33M1JC07
0.47	225.87	6	3.0	4	7	1.5	0.45	SSR47M063ST	SSRR47M1JC07
1	106.16	13	3.0	4	7	1.5	0.45	SS010M063ST	SSR010M1JC07
2.2	48.25	21	3.0	4	7	1.5	0.45	SS2R2M063ST	SSR2R2M1JC07
3.3	32.17	26	3.0	4	7	1.5	0.45	SS3R3M063ST	SSR3R3M1JD07
4.7	22.59	33	3.0	6	7	2.5	0.45	SS4R7M063ST	SSR4R7M1JE07V

Type SXR
Radial Leaded Capacitors

MALLORY



- Low Impedance
- Low ESR
- High Ripple
- Long Life
- 2000 Hour Load Life For Dia ≤ 8mm; 3000 Hours for 10mm Dia
- 5000 Hour Load Life For Dia ≥12mm
- Ideal in Applications for Output Switching Power Supplies

SXR parts are available taped in Ammo pack and taped and reeled. See page 124 for details.

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +105°C

Voltage Range:
6.3 WVDC to 100 WVDC

Capacitance Range:
22 μF to 15000 μF

Capacitance Tolerance:
±20%

DC Leakage Current:
I = .01CV after 2 minutes
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVDC for 1,000 hrs for Dia ≤8, 2,000 hrs for Dia = 10, 5000 Hours For Dia ≥12mm (at 105°C)
- Capacitance Change: 20%* of initial limits
- DC leakage current meets initial limits
- ESR ≤200% of initial value

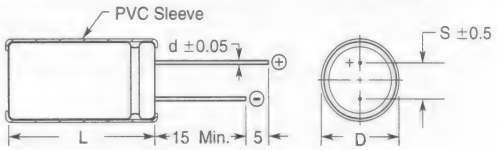
Shelf Life:
1,000 hrs - no voltage applied at 105°C
- Capacitance Change: 20% from initial limits
- DC leakage current meets initial limits
- ESR ≤200% of initial value

The maximum ripple current at 105°C and 100 kHz for SXR capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Temperature (C)	65	75	85	95	105
Multiplier	2.12	1.92	1.69	1.50	1.00

Rated WVDC	Ripple Multipliers					
	60Hz	120Hz	400Hz	1kHZ	10kHZ	100kHZ
10 - 16	.45	.60	.83	.94	.98	1.00
25 - 35	.38	.50	.75	.90	.97	1.00
50 - 100	.36	.46	.70	.88	.94	1.00

Outline Dimensions
(Millimeters)



Case vented on diameters 6.3 and greater

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length

Dissipation Factor @ 120Hz, 25°C									
WV (V)	6.3	10	16	25	35	50	63	80	100
DF(%)	22	19	16	14	12	10	8	8	7

For capacitors whose capacitance value exceeds 1000μF, the value of DF(%) is increased 2% for every additional 1000μF.

Cap μF	Max ESR Ohms 100KHz 25°C	Max Ripple mA 100KHz 105°C	Max LC μA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
6.3 WVDC; 8 VDC Surge									
120	2.43	154	7.6	5	11	2	0.5	SXR121M6R3ST	
150	1.95	210	9.5	6	11	2.5	0.5	SXR151M6R3ST	
220	1.33	260	13.9	8	11	3.5	0.5	SXR221M6R3ST	
330	0.88	350	20.8	8	11	3.5	0.5	SXR331M6R3ST	
470	0.62	510	29.6	10	12	5	0.6	SXR471M6R3ST	
680	0.43	635	42.8	10	16	5	0.6	SXR681M6R3ST	
820	0.36	650	51.7	10	16	5	0.6	SXR821M6R3ST	
1000	0.29	860	63.0	10	20	5	0.6	SXR102M6R3ST	
1200	0.24	860	75.6	10	20	5	0.6	SXR122M6R3ST	
1500	0.20	1030	94.5	10	25	5	0.6	SXR152M6R3ST	
3300	0.10	1280	207.9	12	35	5	0.6	SXR332M6R3ST	
4700	0.08	1770	296.1	12	35	5	0.6	SXR472M6R3ST	
6800	0.07	1810	428.4	16	32	7.5	0.8	SXR682M6R3ST	
8200	0.06	2030	516.6	16	36	7.5	0.8	SXR822M6R3ST	
10000	0.05	2320	630.0	16	40	7.5	0.8	SXR103M6R3ST	
15000	0.04	2460	945.0	18	40	7.5	0.8	SXR153M6R3ST	

Type SXR
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 100kHz 25°C	Max Ripple mA 100kHz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
10 WVDC; 13 VDC Surge									
100	2.52	180	10.0	6	11	2.5	0.5	SXR101M010ST	
120	2.10	210	12.0	6	11	2.5	0.5	SXR121M010ST	
150	1.68	240	15.0	6	11	2.5	0.5	SXR151M010ST	
220	1.15	300	22.0	8	11	3.5	0.5	SXR221M010ST	WGR221M1AF16V
330	0.76	400	33.0	8	12	3.5	0.5	SXR331M010ST	WGR331M1AF16V
470	0.54	500	47.0	10	12	5	0.6	SXR471M010ST	WGR471M1AG18V
680	0.37	650	68.0	10	16	5	0.6	SXR681M010ST	WGR681M1AG21V
820	0.31	860	82.0	10	20	5	0.6	SXR821M010ST	
1000	0.25	970	100.0	10	20	5	0.6	SXR102M010ST	
1200	0.21	1030	120.0	10	25	5	0.6	SXR122M010ST	
1500	0.18	1150	150.0	10	30	5	0.6	SXR152M010ST	
2200	0.13	1320	220.0	12	30	5	0.6	SXR222M010ST	WGR222M1AJ26V
3300	0.09	1770	330.0	12	35	5	0.6	SXR332M010ST	WGR332M1AJ31V
4700	0.08	1810	470.0	16	32	7.5	0.8	SXR472M010ST	WGR472M1AJ41V
6800	0.06	2030	680.0	16	36	7.5	0.8	SXR682M010ST	
10000	0.05	2460	1000.0	18	40	7.5	0.8	SXR103M010ST	
16 WVDC; 20 VDC Surge									
100	2.12	230	16.0	8	16	3.5	0.5	SXR101M016ST	WGR101M1CF16V
120	1.77	260	19.2	8	11	3.5	0.5	SXR121M016ST	
150	1.42	300	24.0	8	11	3.5	0.5	SXR151M016ST	
220	0.97	400	35.2	8	11	3.5	0.5	SXR221M016ST	WGR221M1CG18V
330	0.64	500	52.8	10	12	5	0.6	SXR331M016ST	WGR331M1CG18V
470	0.45	650	75.2	10	16	5	0.6	SXR471M016ST	WGR471M1CG21V
680	0.31	860	108.8	10	20	5	0.6	SXR681M016ST	WGR681M1CG26V
820	0.26	1030	131.2	10	25	5	0.6	SXR821M016ST	
1000	0.21	1150	160.0	10	30	5	0.6	SXR102M016ST	WGR102M1CJ26V
1200	0.18	1120	192.0	12	25	5	0.6	SXR122M016ST	
1500	0.15	1320	240.0	12	25	5	0.6	SXR152M016ST	
2200	0.11	1540	352.0	12	30	5	0.6	SXR222M016ST	WGR222M1CJ31V
3300	0.08	1980	528.0	12	40	5	0.6	SXR332M016ST	WGR332M1CJ41V
4700	0.07	2030	752.0	16	36	7.5	0.8	SXR472M016ST	WGR472M1CK42V
6800	0.05	2240	1088.0	18	36	7.5	0.8	SXR682M016ST	
8200	0.05	2460	1312.0	18	40	7.5	0.8	SXR822M016ST	
25 WVDC; 32 VDC Surge									
100	1.86	300	25.0	8	16	3.5	0.5	SXR101M025ST	WGR101M1EF16V
120	1.55	350	30.0	8	11	3.5	0.5	SXR121M025ST	
150	1.24	400	37.5	10	12	5	0.6	SXR151M025ST	
220	0.84	500	55.0	10	12	5	0.6	SXR221M025ST	WGR221M1EG18V
330	0.56	650	82.5	10	16	5	0.6	SXR331M025ST	WGR331M1EG21V
470	0.40	860	117.5	10	20	5	0.6	SXR471M025ST	WGR471M1EG26V
680	0.27	1150	170.0	10	30	5	0.6	SXR681M025ST	WGR681M1EJ26V
820	0.23	1120	205.0	12	25	5	0.6	SXR821M025ST	
1000	0.19	1320	250.0	12	25	5	0.6	SXR102M025ST	
1200	0.15	1400	300.0	12	30	5	0.6	SXR122M025ST	
1500	0.13	1540	375.0	12	30	5	0.6	SXR152M025ST	
2200	0.10	1980	550.0	12	40	5	0.6	SXR222M025ST	
3300	0.07	2030	825.0	16	36	7.5	0.8	SXR332M025ST	WGR332M1EK42V
4700	0.06	2460	1175.0	18	40	7.5	0.8	SXR472M025ST	

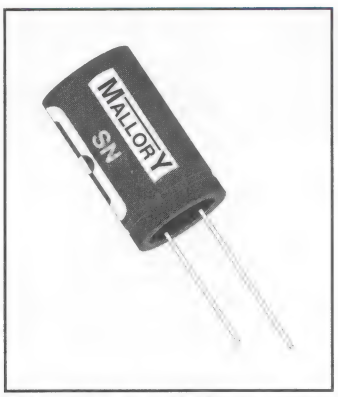
Type SXR
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 100kHz 25°C	Max Ripple mA 100kHz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
35 WVDC; 44 VDC Surge									
100	1.59	400	35.0	10	12	5	0.6	SXR101M035ST	WGR101M1VF16V
120	1.33	510	42.0	10	12	5	0.6	SXR121M035ST	
150	1.06	550	52.5	10	12	5	0.6	SXR151M035ST	WGR151M035
220	0.72	650	77.0	10	16	5	0.6	SXR221M035ST	WGR221M1VG21V
330	0.48	860	115.5	10	20	5	0.6	SXR331M035ST	WGR331M1VG26V
470	0.34	1150	164.5	10	30	5	0.6	SXR471M035ST	WGR471M1VJ26V
680	0.23	1320	238.0	12	25	5	0.6	SXR681M035ST	WGR681M1VJ31V
820	0.19	1400	287.0	12	30	5	0.6	SXR821M035ST	
1000	0.16	1540	350.0	12	30	5	0.6	SXR102M035ST	WGR102M1VJ41V
1200	0.13	1770	420.0	12	35	5	0.6	SXR122M035ST	
1500	0.12	1980	525.0	12	40	5	0.6	SXR152M035ST	
2200	0.08	2030	770.0	16	36	7.5	0.8	SXR222M035ST	WGR222M1VK42V
3300	0.47	2460	1155.0	18	40	7.5	0.8	SXR332M035ST	
50 WVDC; 63 VDC Surge									
68	1.95	400	34.0	10	12	5	0.6	SXR680M050ST	WGR680M1HF16V
100	1.33	635	50.0	10	16	5	0.6	SXR101M050ST	WGR101M1HG18V
120	1.11	650	60.0	10	16	5	0.6	SXR121M050ST	
150	0.88	860	75.0	10	20	5	0.6	SXR151M050ST	
220	0.60	1030	110.0	10	25	5	0.6	SXR221M050ST	WGR221M1HG26V
330	0.40	1150	165.0	10	30	5	0.6	SXR331M050ST	WGR331M1HJ26V
470	0.28	1320	235.0	12	25	5	0.6	SXR471M050ST	WGR471M1HJ31V
680	0.20	1770	340.0	12	35	5	0.6	SXR681M050ST	WGR681M1HJ41V
820	0.16	1980	410.0	12	40	5	0.6	SXR821M050ST	
1000	0.13	1810	500.0	16	32	7.5	0.8	SXR102M050ST	WGR102M1HK42V
1200	0.11	2030	600.0	16	36	7.5	0.8	SXR122M050ST	
1500	0.10	2320	750.0	16	40	7.5	0.8	SXR152M050ST	
63 WVDC; 79 VDC Surge									
47	2.26	305	29.6	10	12	5	0.6	SXR470M063ST	WGR470M1JF16V
68	1.56	500	42.8	10	16	5	0.6	SXR680M063ST	WGR680M1JG18V
100	1.06	550	63.0	10	16	5	0.6	SXR101M063ST	WGR101M1JG26V
120	0.88	620	75.6	10	20	5	0.6	SXR121M063ST	
150	0.71	795	94.5	10	25	5	0.6	SXR151M063ST	
220	0.48	890	138.6	12	25	5	0.6	SXR221M063ST	WGR221M1JJ26V
330	0.32	1320	207.9	12	30	5	0.6	SXR331M063ST	WGR331M1JJ31V
470	0.23	1450	296.1	12	35	5	0.6	SXR471M063ST	WGR471M1JJ41V
680	0.16	1790	428.4	16	32	7.5	0.8	SXR681M063ST	WGR681M1JK42V
1000	0.11	2200	630.0	18	36	7.5	0.8	SXR102M063ST	
1200	0.09	2370	756.0	18	40	7.5	0.8	SXR122M063ST	
100 WVDC; 125 VDC Surge									
22	4.22	305	22.0	10	12	5	0.6	SXR220M100ST	
33	2.81	500	33.0	10	16	5	0.6	SXR330M100ST	
47	1.98	600	47.0	10	20	5	0.6	SXR470M100ST	WGR470M2AG26V
68	1.37	795	68.0	10	25	5	0.6	SXR680M100ST	WGR680M2AJ26V
100	0.93	955	100.0	10	30	5	0.6	SXR101M100ST	WGR101M2AJ31V
120	0.77	1040	120.0	12	30	5	0.6	SXR121M100ST	
150	0.62	1200	150.0	12	30	5	0.6	SXR151M100ST	
220	0.42	1440	220.0	16	32	7.5	0.8	SXR221M100ST	WGR221M2AK35V
330	0.28	1790	330.0	18	36	7.5	0.8	SXR331M100ST	WGR331M2AL42V

Type SN
Radial Leaded Capacitors

MALLORY



- 85°C Non-Polar
- Radial Leads
- Small Size
- Suitable For Use in Circuits Where Polarity is Unknown or Reversed Such as Signal Coupling Circuits & Speakers

SN parts are available taped in Ammo pack and taped and reeled. See page 124 for details.

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
6.3 WVNP to 100 WVNP

Capacitance Range:
0.47 μF to 2200 μF

Capacitance Tolerance:
$\pm$20%

DC Leakage Current:
I = .03CV +3μA after 5 minutes
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVNP for 1,000 hrs at 85°C with polarity inverted every 250 Hrs.

- Capacitance Change: 25% of initial limits
- DC leakage current meets initial limits
- ESR $\leq$150% of initial value

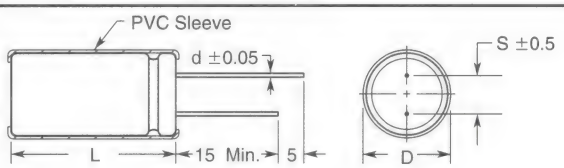
Shelf Life:
500 hrs - no voltage applied at 85°C

- Capacitance Change: 25% from initial limits
- DC leakage $\leq$200% of initial value
- ESR $\leq$200% of initial value

Dissipation Factor @ 120Hz, 25°C							
WV (V)	6.3	10	16	25	35	50	100
DF(%)	24	20	17	15	14	12	10

For capacitors whose capacitance value exceeds 1000μF, the value of DF(%) is increased 2% for every additional 1000μF.

Outline Dimensions
(Millimeters)



Case vented on diameters 6.3 and greater.

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length.

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
6.3 WVNP; 8 VNP Surge								
33	9.65	63	5	11	2	0.5	SN330M6R3ST	NKR330M0JD11
47	6.78	84	6	11	2.5	0.5	SN470M6R3ST	NKR470M0JE11V
100	3.18	140	8	11.5	3.5	0.5	SN101M6R3ST	NKR101M0JF11V
220	1.45	235	10	12	5	0.6	SN221M6R3ST	NKR221M0JG13V
330	0.97	310	10	16	5	0.6	SN331M6R3ST	NKR331M0JG16V
470	0.68	400	10	20	5	0.6	SN471M6R3ST	NKR471M0JG21V
1000	0.32	690	13	25	5	0.6	SN102M6R3ST	NKR102M0JJ26V
2200	0.16	1250	16	32	7.5	0.8	SN222M6R3ST	NKR222M0JK32V
10 WVNP; 13 VNP Surge								
10	26.54	42	5	11	2	0.5	SN100M010ST	
22	12.06	57	5	11	2	0.5	SN220M010ST	NKR220M1AD11
33	8.04	77	6	11	2.5	0.5	SN330M010ST	NKR330M1AE11V
47	5.65	93	6	11	2.5	0.5	SN470M010ST	NKR470M1AE11V
100	2.65	193	8	11.5	3.5	0.5	SN101M010ST	NKR101M1AF11V
220	1.21	255	10	16	5	0.6	SN221M010ST	NKR221M1AG16V
330	0.80	380	10	20	5	0.6	SN331M010ST	NKR331M1AG21V
470	0.56	470	13	20	5	0.6	SN471M010ST	NKR471M1AJ21V
1000	0.27	885	16	25	7.5	0.8	SN102M010ST	NKR102M1AK32V
2200	0.13	1450	16	36	7.5	0.8	SN222M010ST	NKR222M1AK35V

Type SN
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
16 WVNP; 20 VNP Surge								
10	22.56	42	6	11	2	0.5	SN100M016ST	NKR100M1CD11
22	10.25	69	6	11	2.5	0.5	SN220M016ST	NKR220M1CE11V
33	6.84	98	8	11.5	3.5	0.5	SN330M016ST	NKR330M1CF11V
47	4.80	115	8	11.5	3.5	0.5	SN470M016ST	NKR470M1CF11V
100	2.26	205	10	16	5	0.6	SN101M016ST	NKR101M1CG16V
220	1.03	330	10	20	5	0.6	SN221M016ST	NKR221M1CG21V
330	0.68	445	13	20	5	0.6	SN331M016ST	NKR331M1CJ21V
470	0.48	570	13	25	5	0.6	SN471M016ST	NKR471M1CJ26V
1000	0.23	1020	16	32	7.5	0.8	SN102M016ST	NKR102M1CK32V
25 WVNP; 32 VNP Surge								
1	199.04	17	5	11	2	0.5	SN010M025ST	
2.2	90.47	25	5	11	2	0.5	SN2R2M025ST	
4.7	42.35	34	5	11	2	0.5	SN4R7M025ST	NKR4R7M1ED11
10	19.90	50	6	11	2.5	0.5	SN100M025ST	NKR100M1EE11V
22	9.05	86	8	11.5	3.5	0.5	SN220M025ST	NKR220M1EF11V
33	6.03	105	8	11.5	3.5	0.5	SN330M025ST	NKR330M1EF11V
47	4.23	140	10	12	5	0.6	SN470M025ST	NKR470M1EG13V
100	1.99	240	10	20	5	0.6	SN101M025ST	NKR101M1EG21V
220	0.90	390	13	20	5	0.6	SN221M025ST	NKR221M1EJ21V
330	0.60	580	16	25	7.5	0.8	SN331M025ST	NKR331M1EK25V
470	0.42	690	16	25	7.5	0.8	SN471M025ST	NKR471M1EK32V
35 WVNP; 44 VNP Surge								
3.3	56.30	27	5	11	2	0.5	SN3R3M035ST	
4.7	39.53	34	5	11	2	0.5	SN4R7M035ST	NKR4R7M1VD11
10	18.58	54	6	11	2.5	0.5	SN100M035ST	NKR100M1VE11V
22	8.44	94	8	11.5	3.5	0.5	SN220M035ST	NKR220M1VF11V
33	5.63	125	10	12	5	0.6	SN330M035ST	NKR330M1VG13V
47	3.95	165	10	16	5	0.6	SN470M035ST	NKR470M1VG16V
100	1.86	285	13	20	5	0.6	SN101M035ST	NKR101M1VJ21V
220	0.84	520	16	25	5	0.6	SN221M035ST	NKR221M1VJ26V
330	0.56	630	16	25	7.5	0.8	SN331M035ST	NKR331M1VK25V
470	0.40	820	16	32	7.5	0.8	SN471M035ST	NKR471M1VK32V
50 WVNP; 63 VNP Surge								
0.47	338.80	11	5	11	2	0.5	SNR47M050ST	NKRR47M1HD11
1	159.24	17	5	11	2	0.5	SN010M050ST	NKR010M1HD11
2.2	72.38	25	5	11	2	0.5	SN2R2M050ST	NKR2R2M1HD11
3.3	48.25	31	6	11	2.5	0.5	SN3R3M050ST	NKR3R3M1HE11V
4.7	33.88	41	6	11	2.5	0.5	SN4R7M050ST	NKR4R7M1HE11V
10	15.92	70	8	11.5	3.5	0.5	SN100M050ST	NKR100M1HF11V
22	7.24	115	10	12	5	0.6	SN220M050ST	NKR220M1HG13V
33	4.83	150	10	16	5	0.6	SN330M050ST	NKR330M1HG16V
47	3.39	190	10	20	5	0.6	SN470M050ST	NKR470M1HG21V
100	1.59	310	13	20	5	0.6	SN101M050ST	NKR101M1HJ26V
220	0.72	570	16	25	7.5	0.8	SN221M050ST	NKR221M1HK32V
330	0.48	790	16	36	7.5	0.8	SN331M050ST	NKR331M1HK35V

Type SN
Radial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Size (Millimeters) D Diameter	L Length	S Lead Space	d	New Catalog Number	Previous Catalog Number
63 WVNP; 79 VNP Surge								
1	159.24	17	5	11	2	0.5	SN010M063ST	
2.2	72.38	25	5	11	2	0.5	SN2R2M063ST	NKR2R2M1JD11
3.3	48.25	37	5	11	2.5	0.5	SN3R3M063ST	NKR3R3M1JE11V
4.7	33.88	44	6	11	2.5	0.5	SN4R7M063ST	NKR4R7M1JE11V
10	15.92	74	8	11.5	3.5	0.5	SN100M063ST	NKR100M1JF11V
22	7.24	130	10	16	5	0.6	SN220M063ST	NKR220M1JG16V
33	4.83	175	10	20	5	0.6	SN330M063ST	NKR330M1JG21V
47	3.39	230	13	20	5	0.6	SN470M063ST	NKR470M1JJ21V
100	1.59	410	16	25	7.5	0.8	SN101M063ST	NKR101M1JK25V
220	0.72	660	16	32	7.5	0.8	SN221M063ST	NKR221M1JK32V
100 WVNP; 125 VNP Surge								
0.47	282.33	14	5	11	2	0.5	SNR47M100ST	NKRR47M2AD11
1	132.70	21	5	11	2	0.5	SN010M100ST	NKR010M2AD11
2.2	60.32	34	6	11	2.5	0.5	SN2R2M100ST	NKR2R2M2AE11V
3.3	40.21	49	8	11.5	3.5	0.5	SN3R3M100ST	NKR3R3M2AF11V
4.7	28.23	58	8	11.5	3.5	0.5	SN4R7M100ST	NKR4R7M2AF11V
10	13.27	100	10	12	5	0.6	SN100M100ST	NKR100M2AG16V
22	6.03	180	13	20	5	0.6	SN220M100ST	NKR220M2AJ21V
33	4.02	220	13	20	5	0.6	SN330M100ST	NKR330M2AJ26V
47	2.82	285	13	25	7.5	0.8	SN470M100ST	NKR470M2AK25V
100	1.33	510	16	32	7.5	0.8	SN101M100ST	NKR101M2AK32V

Fig. 1 - Formed Taping

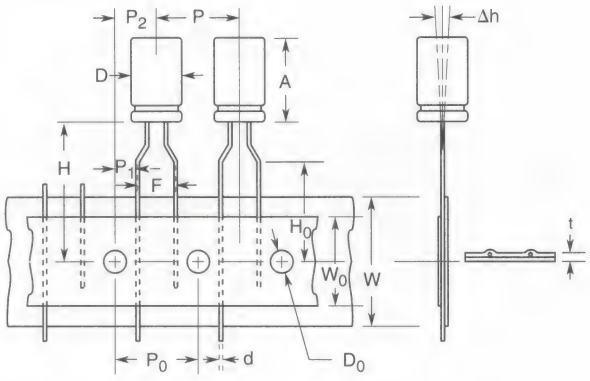


Fig. 2 - Straight Taping (Under 13ø)

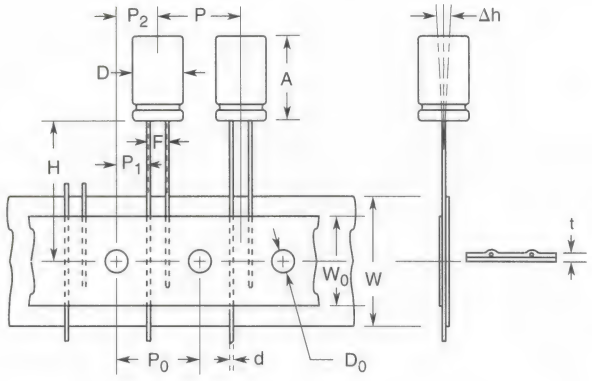
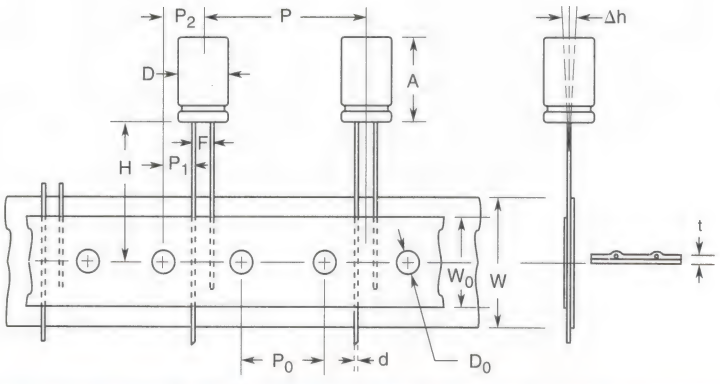


Fig. 3- Straight Taping (16ø, 18ø)

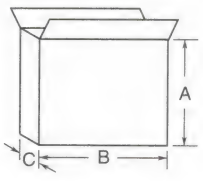


Standard Lead Spacing of Taped Components is 5mm
Other Lead Spacing is Available by Special Order
Contact NACC for Information

Code	D	A	d	P	P_0	P_1	P_2	F	W	W_0	H	H_0	D_0	t	Δh	Fig.
Tolerance	±0.5	±1.0	±0.05	±1.0	±0.2	±0.7	±1.3	+0.8 -0.2	±0.5	Min.	±0.75	±0.5	±0.2	±0.2	Max.	
Item	4 ~ 6.3	7.0	0.45	12.7	12.7	3.85	6.35	5.0	18.0	12.5	18.5	16.0	4.0	0.7	2.0	1
	5 ~ 8	12.5	0.5	12.7	12.7	3.85	6.35	5.0	18.0	12.5	18.5	16.0	4.0	0.7	2.0	
	5, 6.3	12.5	0.5	12.7	12.7	5.1	6.35	2.5	18.0	12.5	18.5	—	4.0	0.7	2.0	2
	8	12.5	0.5	12.7	12.7	4.6	6.35	3.5	18.0	12.5	18.5	—	4.0	0.7	2.0	
	10	21.0	0.6	12.7	12.7	3.85	6.35	5.0	18.0	12.5	18.5	—	4.0	0.7	2.0	
	12, 13	26.0	0.6	15.0	15.0	5.0	7.5	5.0	18.0	12.5	18.5	—	4.0	0.7	2.0	
	16, 18	26.0	0.8	30.0	15.0	3.75	7.5	7.5	18.0	12.5	18.0	—	4.0	0.7	2.0	3

Capacitor Diameter D (mm)	Ammo Pack Box Dimensions (mm)			Quantity Per Ammo Pack Box
	A±5	B Max	C±3	
4	250	340	54	2,500
5	250	340	54	2,000
6.3	290	340	54	2,000
8	250	340	54	1,000
10 (12 L)	290	340	54	750
10 (16 L)	350	340	59	900
10 (20 L)	340	340	71	900
12, 13	340	340	71	500
16	340	340	71	250

Ammo Pack



Ammo Pack boxes are shipped 5 to the outer packing carton

Tape And Reel Quantities		
Case Diameter D (mm)	Reel Width	Reel Qty. (Pcs.)
4	44	1500
5	44	1300
6	44	1100
8	44	750
10 (12L)	44	600
10 (16L)	50	600
12, 13	-	-
16	-	-

Type VPR
Radial Leaded Capacitors

MALLORY

- 105°C - Long Life
- Low ESR
- High Reliability
- Ideal For Use as an Output Filter for SMPS

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +105°C

Voltage Range:
6.3 WVDC to 100 WVDC
Up to 250 WVDC available

Capacitance Range:
34 μF to 12,000 μF

Capacitance Tolerance:
-10% +75%
Other tolerances available

DC Leakage Current:
I = .002CV
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVDC for 2,000 hrs at 105°C
- Capacitance change within 15% of initial limits
- DC leakage current meets initial limits
- ESR ≤150% of initial measured value

The maximum ripple current at 85°C and 10 kHz for VPR capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Ambient Temperature	Ripple Multipliers
95°C	.75
85°C	1.0
75°C	1.2
65°C	1.37
55°C	1.52
45°C	1.66

Cap μF	Max ESR Ohms 10kHz 25°C	Max Ripple Amps 10kHz 85°C	Size (Inches) D Diameter	L Length	S Lead Space	d	Catalog Number
6.3 WVDC; 8 VDC Surge							
880	.121	1.430	.512	1.024	.200	.023	VPR881U6R3E1A
5,600	.034	3.767	1.000	1.625	.400	.040	VPR562U6R3N1L
8,800	.023	5.131	1.000	2.125	.400	.040	VPR882U6R3N2C
12,000	.018	6.364	1.000	2.625	.400	.040	VPR123U6R3N2L
7.5 WVDC; 10 VDC Surge							
780	.117	1.450	.512	1.024	.200	.023	VPR781U7R5E1A
1,700	.057	2.590	.512	1.024	.200	.023	VPR172U7R5E1A
2,600	.037	2.862	.750	1.625	.250	.040	VPR262U7R5J1L
4,900	.031	3.820	1.000	1.625	.400	.040	VPR492U7R5N1L
10 WVDC; 13 VDC Surge							
660	.115	1.470	.512	1.024	.200	.023	VPR661U010E1A
990	.076	1.970	.512	1.300	.200	.023	VPR991U010E1E
4,200	.032	3.702	1.000	1.625	.400	.040	VPR422U010N1L
12 WVDC; 18 VDC Surge							
1,200	.055	2.640	.512	1.654	.200	.023	VPR122U012E1L
1,800	.044	2.519	.750	1.625	.250	.040	VPR182U012J1L
5,600	.021	4.932	1.000	2.125	.400	.040	VPR562U012N2C
16 WVDC; 20 VDC Surge							
500	.110	1.500	.512	1.024	.200	.023	VPR501U016E1A
1,600	.044	2.465	.750	1.625	.250	.040	VPR162U016J1L
2,300	.040	2.863	.875	1.625	.300	.040	VPR232U016L1L
3,200	.029	3.637	1.000	1.625	.400	.040	VPR322U016N1L
3,700	.026	3.981	.875	2.125	.300	.040	VPR372U016L2C
5,000	.020	4.887	1.000	2.125	.400	.040	VPR502U016N2C
6,900	.017	6.105	1.000	2.625	.400	.040	VPR692U016N2L
10,000	.012	8.033	1.000	3.625	.400	.040	VPR103U016N3L
25 WVDC; 30 VDC Surge							
640	.067	2.390	.512	1.654	.200	.023	VPR641U025E1L
940	.037	2.404	.750	1.625	.250	.040	VPR941U025J1L
1,300	.035	2.729	.875	1.625	.300	.040	VPR132U025L1L
1,400	.026	3.230	.750	2.125	.250	.040	VPR142U025J2C
1,800	.035	3.006	1.000	1.625	.400	.040	VPR182U025N1L
2,800	.018	4.732	.875	2.625	.300	.040	VPR282U025L2L
2,800	.023	4.107	1.000	2.125	.400	.040	VPR282U025N2C

Cap μF	Max ESR Ohms 10kHz 25°C	Max Ripple Amps 10kHz 85°C	Size (Inches) D Diameter	L Length	S Lead Space	d	Catalog Number
25 WVDC; 30 VDC Surge							
3,900	.018	5.191	1.000	2.625	.400	.040	VPR392U025N2L
5,900	.014	6.616	1.000	3.625	.400	.040	VPR592U025N3L
40 WVDC; 50 VDC Surge							
160	.171	1.200	.512	1.024	.200	.023	VPR161U040E1A
240	.114	1.610	.512	1.300	.200	.023	VPR241U040E1E
360	.091	2.050	.512	1.654	.200	.023	VPR361U040E1L
540	.044	1.925	.750	1.625	.250	.040	VPR541U040J1L
760	.040	2.194	.875	1.625	.300	.040	VPR761U040L1L
850	.029	2.683	.750	2.125	.250	.040	VPR851U040J2C
1,100	.018	3.695	.750	2.625	.250	.040	VPR112U040J2L
1,600	.021	3.755	1.000	2.125	.400	.040	VPR162U040N2C
2,200	.017	4.732	1.000	2.625	.400	.040	VPR222U040N2L
2,800	.014	5.651	1.000	3.125	.400	.040	VPR282U040N3C
3,300	.014	6.437	1.000	3.625	.400	.040	VPR332U040N3L
50 WVDC; 65 VDC Surge							
110	.317	.880	.512	1.024	.200	.023	VPR111U050E1A
160	.218	1.160	.512	1.300	.200	.023	VPR161U050E1E
250	.139	1.660	.512	1.654	.200	.023	VPR251U050E1L
600	.049	1.964	.875	1.625	.300	.040	VPR601U050L1L
1,200	.028	3.297	1.000	2.125	.400	.040	VPR122U050N2C
2,400	.015	5.639	1.000	3.625	.400	.040	VPR242U050N3L
75 WVDC; 95 VDC Surge							
62	.489	.710	.512	1.024	.200	.023	VPR620U075E1A
140	.216	1.330	.512	1.654	.200	.023	VPR141U075E1L
350	.063	2.047	.750	2.125	.250	.040	VPR351U075J2C
450	.102	1.779	1.000	1.625	.400	.040	VPR451U075N1L
680	.069	2.420	1.000	2.125	.400	.040	VPR681U075N2C
1,100	.044	3.577	1.000	3.125	.400	.040	VPR112U075N3C
100 WVDC; 125 VDC Surge							
34	.691	.530	.512	1.024	.200	.023	VPR340U100E1A
78	.301	1.010	.512	1.654	.200	.023	VPR780U100E1L
130	.164	1.124	.750	1.625	.250	.040	VPR131U100J1L
190	.143	1.441	.750	2.125	.250	.040	VPR191U100J2C
250	.111	1.818	1.000	1.625	.400	.040	VPR251U100N1L

Type VPR
Radial Leaded Capacitors

MALLORY

Case Code Chart
Uninsulated Case Size

Case Code	Inches			Millimeters			Lead Wire Size	
	D	L	S	D	L	S	Inches	AWG
E1A	.512	1.024	.200	13	26	5.08	.023	#20
E1E	.512	1.300	.200	13	33	5.08	.023	#20
E1L	.512	1.654	.200	13	42	5.08	.023	#20
J1C	.750	1.125	.250	19.1	28.6	6.35	.040	#18
J1L	.750	1.625	.250	19.1	41.3	6.35	.040	#18
J2C	.750	2.125	.250	19.1	53.9	6.35	.040	#18
J2L	.750	2.625	.250	19.1	66.7	6.35	.040	#18
J3C	.750	3.125	.250	19.1	79.4	6.35	.040	#18
J3L	.750	3.625	.250	19.1	92.1	6.35	.040	#18
L1C	.875	1.125	.300	22.2	28.6	7.62	.040	#18
L1L	.875	1.625	.300	22.2	41.3	7.62	.040	#18
L2C	.875	2.125	.300	22.2	53.9	7.62	.040	#18
L2L	.875	2.625	.300	22.2	66.7	7.62	.040	#18
L3C	.875	3.125	.300	22.2	79.4	7.62	.040	#18
L3L	.875	3.625	.300	22.2	92.1	7.62	.040	#18
N1C	1.000	1.125	.400	25.4	28.6	10.16	.040	#18
N1L	1.000	1.625	.400	25.4	41.3	10.16	.040	#18
N2C	1.000	2.125	.400	25.4	53.9	10.16	.040	#18
N2L	1.000	2.625	.400	25.4	66.7	10.16	.040	#18
N3C	1.000	3.125	.400	25.4	79.4	10.16	.040	#18
N3L	1.000	3.625	.400	25.4	92.1	10.16	.040	#18

Part Number Nomenclature

NACC Catalog Number: VPR 372 U 016 L2C 3 A

TYPE NUMBER:
Identifies the basic type

CAPACITANCE:
Expressed in microfarads. The first two digits are significant figures. The third digit is the number of zeros

CAPACITANCE TOLERANCE:
U = -10%+75%, T = -10%+50%
Other tolerances available on special request

DC VOLTAGE RATING:
Zeros are used to precede the voltage rating where necessary to complete the three digit block
The letter 'R' indicates a decimal point

CASE CODE:
Denotes uninsulated diameter and length

INSULATING SLEEVE:
0 = No sleeve, 4 = Plastic sleeve
5 = Plastic sleeve with end seal

LEAD CONFIGURATION:
A (Standard),B, J, or T
(See corresponding figures)

Outline Dimensions
(Inches)

Figure A
.512 Diameter

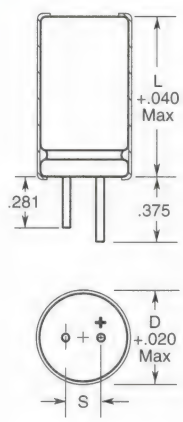


Figure A
.750 Diameter & Greater

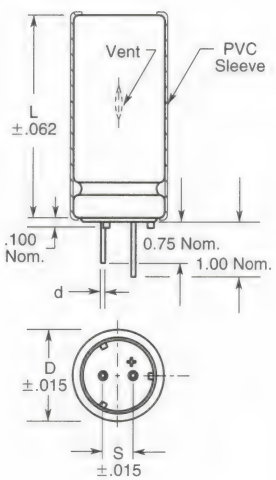


Figure J
(Optional)

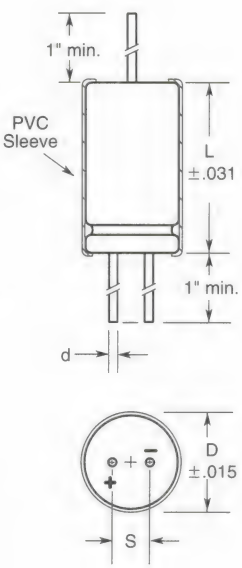


Figure T
(Optional)

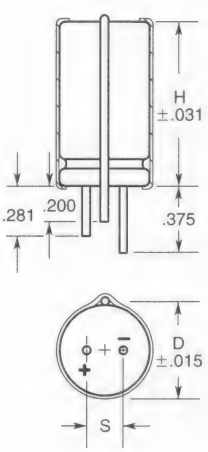
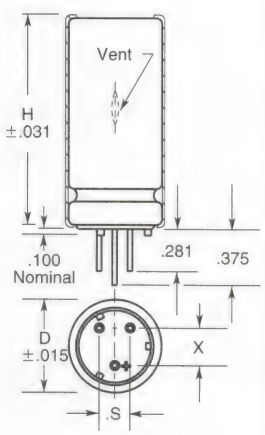


Figure B
(Optional)



PVC sleeve adds .015 to diameter and length.

Aluminum Capacitors

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Part Number Information
Axial Aluminum Electrolytic Capacitors

MALLORY

TKA **100** **M** **100** **S** **T**

Series Type:
SKA, TKA, NPA

Capacitance
Expressed in microfarads. The first two digits are significant figures, the third is the number of zeros. When the microfarads are less than 10 the letter "R" is used to indicate a decimal point.
Examples:

MICROFARADS	NUMBER
3	3R0
10	100
100	101
1000	102

Capacitance Tolerance
K = ± 10%
M = ± 20%

Rated Voltage
Rated Voltage is shown in Volts:
6R3 = 6.3 V
010 = 10 V
100 = 100V

Applicable Grade
A = Taping & Ammunition
E = Different characteristic
R = Tape & Reel
S = Standard

Configuration
1 = Lead cut
2 = Lead form
4 = Lead crimp & cut (form)
5 = Epoxy end seal
T = Standard

Type SKA
Axial Leaded Capacitors

SKA parts are available taped, in Ammo Pack. See page 136 for details.

- 85°C General Purpose
- Axial Leads Miniature Size
- High CV per Case Size
- 2000 Hour Load Life Data for Longer Life
- Suitable for Consumer Electronic Products, Such as Stereo Radio, TV. etc.

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
6.3 WVDC to 450 WVDC

Capacitance Range:
0.47 μF to 15,000 μF

Capacitance Tolerance:
±20%

Dissipation Factor:

Rated Voltage (V)	6.3	10	16	25	35	50	63	100	160~350	400~450
tanδ	0.24	0.20	0.17	0.15	0.12	0.10	0.10	0.10	0.20	0.25

For Capacitance of more than 1,000μF , add 0.002 for every increase of 1,000μF at 120Hz/20°C

DC Leakage Current:
6.3 - 100VDC
I = .01CV or 3μA
at 5 minutes
Over 100VDC
I = .01CV +100μA
at 5 minutes minimum
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVDC for 2,000 hrs at 85°C

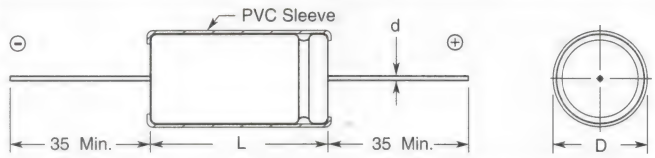
- Capacitance change ≤20% from initial limits
- DC leakage current meets initial limits
- ESR ≤150% of initial measured value

The maximum ripple current at 85°C and 120 Hz for SKA capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers		
	60Hz	120Hz	1kHz
6 to 25	.85	1.0	1.10
35 to 100	.80	1.0	1.15
160 to 250	.75	1.0	1.25
350 to 450	.70	1.0	1.30

Ambient Temperature	Ripple Multiplier
+85°C	1.00
+75°C	1.14
+65°C	1.25

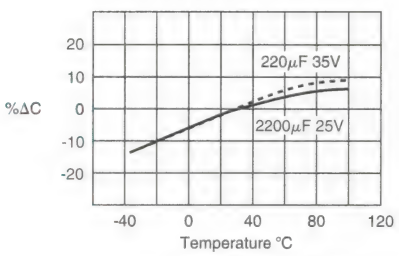
Outline Dimensions
(Millimeters)



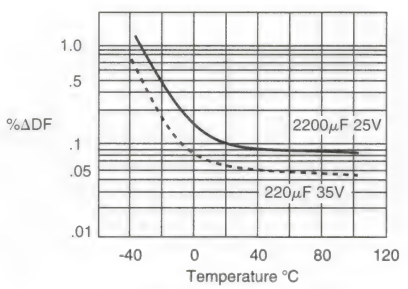
Case vented on diameters 6.3 and greater.

Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length.

Temperature Characteristics

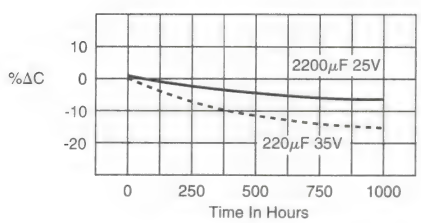


Capacitance Change Ratio

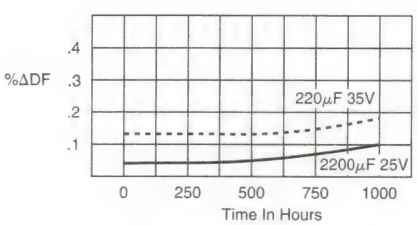


Dissipation Factor Change

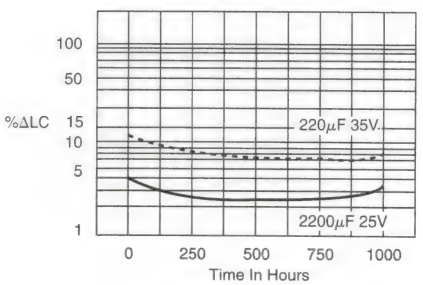
Load Life Characteristics



Capacitance Change Ratio



Dissipation Factor Change



Leakage Current Change

Type SKA
Axial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 5 Minutes	Size (Millimeters) D Diameter	L Length	d	Catalog Number
6.3 WVDC; 8 VDC Surge							
47	10.60	65	3.0	5	12.5	0.6	SKA470M6R3
100	5.00	116	7.0	6	12.5	0.6	SKA101M6R3
220	1.33	204	13.9	6.3	16	0.6	SKA221M6R3
330	1.10	300	20.8	8	16	0.6	SKA331M6R3
470	0.62	396	29.3	8	16	0.6	SKA471M6R3
1,000	0.30	500	63.0	10	20	0.6	SKA102M6R3
2,200	0.14	826	138.6	13	25	0.6	SKA222M6R3
3,300	0.10	1020	207.9	13	30	0.6	SKA332M6R3
10,000	0.07	1450	630.0	18	45	0.8	SKA103M6R3
15,000	0.06	1800	945.0	22	40	0.8	SKA153M6R3
10 WVDC; 13 VDC Surge							
47	6.94	75	5.0	5	12.5	0.6	SKA470M010
100	3.26	180	10.0	6	16	0.6	SKA101M010
220	1.48	204	22.0	8	16	0.6	SKA221M010
330	0.99	249	33.0	8	16	0.6	SKA331M010
470	0.67	400	47.0	8	20	0.6	SKA471M010
1,000	0.33	585	100.0	10	20	0.6	SKA102M010
2,200	0.15	920	220.0	13	25	0.6	SKA222M010
3,300	0.10	1090	330.0	13	30	0.6	SKA332M010
4,700	0.08	1200	470.0	16	30	0.8	SKA472M010
16 WVDC; 20 VDC Surge							
33	6.84	60	5.3	6	12.5	0.6	SKA330M016
47	4.80	70	7.5	6	12.5	0.6	SKA470M016
100	2.76	125	16.0	6	16	0.6	SKA101M016
220	1.27	221	35.2	8	16	0.6	SKA221M016
330	0.85	350	52.8	8	20	0.6	SKA331M016
470	0.53	440	75.2	10	16	0.6	SKA471M016
1,000	0.21	680	180.0	10	25	0.6	SKA102M016
2,200	0.11	1000	352.0	13	30	0.6	SKA222M016
3,300	0.10	1200	528.0	16	30	0.8	SKA332M016
4,700	0.07	1360	752.0	16	40	0.8	SKA472M016
25 WVDC; 32 VDC Surge							
22	10.05	53	5.5	6	12.5	0.6	SKA220M025
33	6.70	77	8.3	6	12.5	0.6	SKA330M025
47	4.70	91	11.8	6	12.5	0.6	SKA470M025
100	2.21	158	25.0	8	16	0.6	SKA101M025
220	1.01	257	55.0	8	20	0.6	SKA221M025
330	0.76	367	82.5	10	16	0.6	SKA331M025
470	0.47	480	118.0	10	20	0.6	SKA471M025
1,000	0.22	850	250.0	13	25	0.6	SKA102M025
2,200	0.11	1200	550.0	16	30	0.8	SKA222M025
3,300	0.09	1300	825.0	16	40	0.8	SKA332M025
4,700	0.07	1500	1175.0	18	40	0.8	SKA472M025
35 WVDC; 44 VDC Surge							
10	17.68	35	3.5	5	12.5	0.6	SKA100M035
22	8.08	53	7.7	6	12.5	0.6	SKA220M035
33	5.54	70	11.6	6	16	0.6	SKA330M035
47	3.76	121	16.5	6	16	0.6	SKA470M035
100	1.77	194	35.0	8	16	0.6	SKA101M035
220	0.80	335	77.0	10	16	0.6	SKA221M035
330	0.54	440	115.5	10	20	0.6	SKA331M035
470	0.38	550	164.5	10	25	0.6	SKA471M035
1,000	0.18	992	350.0	13	30	0.6	SKA102M035
2,200	0.09	1250	770.0	16	40	0.8	SKA222M035
3,300	0.07	1400	1155.0	18	40	0.8	SKA332M035
4,700	0.06	1600	1645.0	22	40	0.8	SKA472M035
50 WVDC; 63 VDC Surge							
10	14.74	36	5.0	6	12.5	0.6	SKA100M050
22	6.70	58	11.0	6	16	0.6	SKA220M050
33	4.47	111	16.5	6	16	0.6	SKA330M050
47	3.14	130	23.5	8	16	0.6	SKA470M050
100	1.47	250	50.0	8	20	0.6	SKA101M050
220	0.67	388	110.0	10	20	0.6	SKA221M050

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 5 Minutes	Size (Millimeters) D Diameter	L Length	d	Catalog Number
50 WVDC; 63 VDC Surge							
330	0.45	433	165.0	10	25	0.6	SKA331M050
470	0.31	650	235.0	13	25	0.6	SKA471M050
1,000	0.15	1050	500.0	16	30	0.8	SKA102M050
2,200	0.08	1300	1100.0	18	40	0.8	SKA222M050
3,300	0.06	1500	1650.0	22	40	0.8	SKA332M050
4,700	0.06	3305	2350.0	22	40	0.8	SKA472M050
63 WVDC; 79 VDC Surge							
4.7	31.40	32	3.0	6	12.5	0.6	SKA4R7M063
10	14.70	51	6.3	6	12.5	0.6	SKA100M063
22	6.70	91	13.9	6	16	0.6	SKA220M063
33	4.47	111	20.8	8	16	0.6	SKA330M063
47	3.14	133	29.6	8	16	0.6	SKA470M063
100	1.47	247	63.0	10	16	0.6	SKA101M063
220	0.67	450	138.6	10	25	0.6	SKA221M063
330	0.45	550	207.9	13	25	0.6	SKA331M063
470	0.31	750	296.1	13	30	0.6	SKA471M063
1,000	0.15	1100	630.0	16	40	0.8	SKA102M063
2,200	0.08	1400	1386.0	22	40	0.8	SKA222M063
100 WVDC; 125 VDC Surge							
0.47	250.80	5	3.0	5	12.5	0.6	SKAR47M100
1	117.90	12	3.0	5	12.5	0.6	SKA010M100
2.2	53.59	21	3.0	6	12.5	0.6	SKA2R2M100
3.3	35.73	30	3.3	6	12.5	0.6	SKA3R3M100
4.7	25.08	39	4.7	6	12.5	0.6	SKA4R7M100
10	11.79	68	10.0	6	16	0.6	SKA100M100
22	5.36	111	22.0	8	16	0.6	SKA220M100
33	3.57	136	33.0	8	20	0.6	SKA330M100
47	2.51	189	47.0	10	20	0.6	SKA470M100
68	1.98	1260	68.0	10	20	0.6	SKA680M100
100	1.18	350	100.0	10	25	0.6	SKA101M100
220	0.54	550	220.0	13	30	0.6	SKA221M100
330	0.36	700	330.0	16	30	0.8	SKA331M100
470	0.25	1031	470.0	16	40	0.8	SKA471M100
1,000	0.12	1447	1000.0	22	40	0.8	SKA102M100
160 WVDC; 200 VDC Surge							
1	266.00	13	101.6	6	16	0.6	SKA010M160
2.2	121.00	22	103.5	6	16	0.6	SKA2R2M160
3.3	80.40	31	105.3	8	16	0.6	SKA3R3M160
4.7	56.50	40	107.5	8	16	0.6	SKA4R7M160
10	26.60	63	116.0	8	20	0.6	SKA100M160
22	12.10	108	135.2	10	20	0.6	SKA220M160
33	8.04	144	152.8	10	25	0.6	SKA330M160
47	5.65	180	175.2	13	30	0.6	SKA470M160
100	2.66	270	260.0	13	30	0.6	SKA101M160
150	1.21	400	340.0	16	30	0.8	SKA151M160
200 WVDC; 250 VDC Surge							
1	332.00	17	102.5	6	16	0.6	SKA010M200
2.2	151.00	30	105.5	6	16	0.6	SKA2R2M200
3.3	101.00	40	108.3	8	16	0.6	SKA3R3M200
4.7	70.60	50	111.7	8	16	0.6	SKA4R7M200
10	33.20	80	125.0	8	20	0.6	SKA100M200
15	25.60	105	137.5	10	16	0.6	SKA150M200
22	15.10	140	155.0	10	20	0.6	SKA220M200
33	10.10	175	182.5	10	25	0.6	SKA330M200
47	7.06	215	217.5	13	25	0.6	SKA470M200
68	5.58	265	270.0	13	30	0.6	SKA680M200
100	3.32	340	350.0	16	30	0.8	SKA101M200
150	1.34	403	475.0	16	30	0.8	SKA151M200

Type SKA
Axial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 5 Minutes	Size (Millimeters) D Diameter	L Length	d	Catalog Number
250 WVDC; 300 VDC Surge							
1	332.00	13	102.5	6	16	0.6	SKA010M250
2.2	151.00	23	105.5	8	16	0.6	SKA2R2M250
3.3	101.00	31	108.3	8	16	0.6	SKA3R3M250
4.7	70.60	37	111.7	8	20	0.6	SKA4R7M250
10	33.20	67	125.0	10	16	0.6	SKA100M250
22	15.10	118	155.0	10	25	0.6	SKA220M250
33	10.10	161	182.5	13	21	0.6	SKA330M250
47	7.06	211	217.5	13	25	0.6	SKA470M250
100	3.32	419	350.0	16	33	0.8	SKA101M250
150	1.34	764	475.0	16	40	0.8	SKA151M250
350 WVDC; 400 VDC Surge							
0.47	881.84	25	101.6	8	16.5	0.6	SKAR47M350
1	332.00	16	104.0	8	16	0.6	SKA010M350
2.2	151.00	25	108.0	8	16	0.6	SKA2R2M350
3.3	101.00	31	112.0	8	20	0.6	SKA3R3M350
4.7	70.60	60	117.0	10	20	0.6	SKA4R7M350
10	33.20	75	135.0	10	20	0.6	SKA100M350
22	15.10	177	177.0	13	21	0.6	SKA220M350
33	10.10	200	216.0	13	25	0.6	SKA330M350
47	7.06	240	365.0	13	30	0.6	SKA470M350
100	3.32	350	450.0	16	40	0.8	SKA101M350
150	1.34	823	625.0	18	40	0.8	SKA151M350

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 5 Minutes	Size (Millimeters) D Diameter	L Length	d	Catalog Number
400 WVDC; 450 VDC Surge							
2.2	151.00	55	108.8	8	20	0.6	SKA2R2M400
3.3	101.00	70	113.2	10	20	0.6	SKA3R3M400
4.7	70.60	90	118.8	10	25	0.6	SKA4R7M400
10	33.20	150	140.0	10	25	0.6	SKA100M400
22	15.10	230	188.0	13	25	0.6	SKA220M400
33	10.10	300	232.0	13	30	0.6	SKA330M400
47	7.06	318	288.0	16	30	0.8	SKA470M400
100	3.32	555	500.0	18	40	0.8	SKA101M400
450 WVDC; 500 VDC Surge							
1	332.00	17	104.5	8	16	0.6	SKA010M450
2.2	151.00	30	109.9	8	20	0.6	SKA2R2M450
3.3	101.00	39	114.9	10	20	0.6	SKA3R3M450
4.7	70.60	51	121.2	10	25	0.6	SKA4R7M450
10	33.20	89	145.0	13	21	0.6	SKA100M450
15	25.60	183	167.5	13	25	0.6	SKA150M450
22	15.10	175	199.0	13	30	0.6	SKA220M450
33	10.10	241	248.5	16	30	0.8	SKA330M450
47	7.06	318	311.5	13	33	0.6	SKA470M450
68	5.58	412	406.0	18	40	0.8	SKA680M450
100	3.32	555	550.0	22	40	0.8	SKA101M450

Type TKA
Axial Leaded Capacitors

NEW

MALLORY

TKA parts are available taped and reeled. See page 136 for details.

- 105°C - Long Life
- Small Size
- Low Leakage Current
- Available in 3,000 Hours Load Life

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +105°C

Voltage Range:
6.3 WVDC to 450 WVDC

Capacitance Range:
0.47 μF to 15,000 μF

Capacitance Tolerance:
±20%

DC Leakage Current:
I = 0.01CV or 3μA whichever is greater after 2 minutes.
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVDC for 1,000 hrs at 105°C
- Capacitance change ±20% of initial limits
- DC leakage current meets initial limits
- ESR ≤200% of initial measured value

Dissipation Factor:

Rated Voltage (V)	6.3	10	16	25	35	50	63	100	160~350	400~450
tanδ	0.24	0.20	0.17	0.15	0.12	0.10	0.10	0.10	0.20	0.25

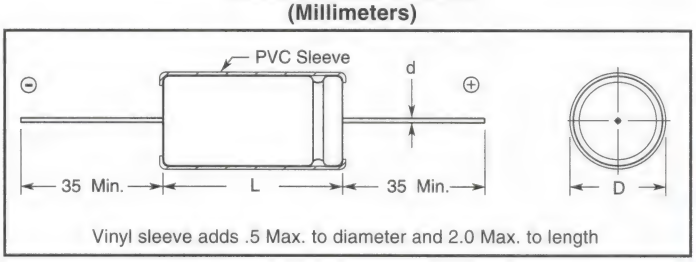
For Capacitance of more than 1,000μF, add 0.002 for every increase of 1,000μF at 120Hz/20°C

The maximum ripple current at 105°C and 120 Hz for TKA capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables.

Rated WVDC	Ripple Multipliers			
	60Hz	120Hz	1kHz	10kHz
6 to 25	.80	1.0	1.10	1.20
35 to 100	.75	1.0	1.30	1.40
160 to 250	.70	1.0	1.40	1.60
350 to 400	.60	1.0	1.50	1.80

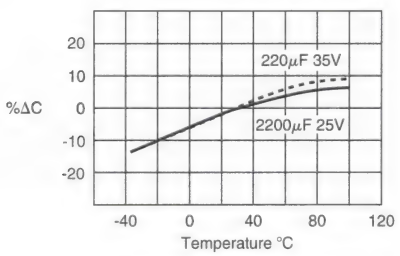
Ambient Temperature	Ripple Multiplier
+105°C	1.00
+85°C	1.50
+70°C	1.80

Outline Dimensions
(Millimeters)

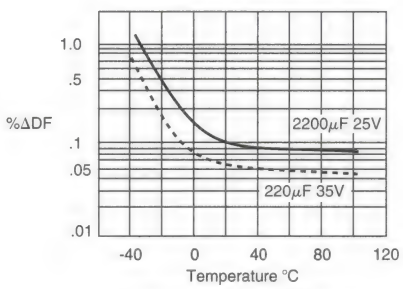


Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length

Temperature Characteristics

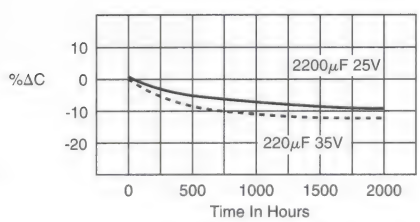


Capacitance Change Ratio

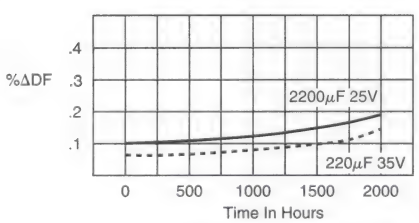


Dissipation Factor Change

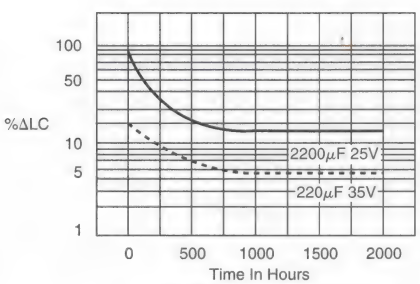
Load Life Characteristics



Capacitance Change Ratio



Dissipation Factor Change



Leakage Current Change

Aluminum Capacitors

Type TKA
Axial Leaded Capacitors

NEW

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	d	Catalog Number
6.3 WVDC; 8 VDC Surge							
0.47	282.18	7	3.0	5	12.5	0.6	TKAR47M6R3ST
33	6.83	55	3.0	5	12.5	0.6	TKA330M6R3ST
47	10.60	51	3.0	5	12.5	0.6	TKA470M6R3ST
68	3.90	63	4.3	5	12.5	0.6	TKA680M6R3ST
100	5.00	82	7.0	6	12.5	0.6	TKA101M6R3ST
150	1.76	110	9.5	6	16	0.6	TKA151M6R3ST
220	1.33	150	13.9	6.3	16	0.6	TKA221M6R3ST
330	1.10	200	20.8	8	16	0.6	TKA331M6R3ST
470	0.62	239	29.3	8	16	0.6	TKA471M6R3ST
680	0.47	300	42.8	8	20	0.6	TKA681M6R3ST
1,000	0.30	393	63.0	10	20	0.6	TKA102M6R3ST
1,500	0.22	535	94.5	10	25	0.6	TKA152M6R3ST
2,200	0.14	733	138.6	13	25	0.6	TKA222M6R3ST
3,300	0.10	953	207.9	13	30	0.6	TKA332M6R3ST
4,700	0.09	1215	296.1	16	30	0.8	TKA472M6R3ST
10 WVDC; 13 VDC Surge							
33	8.04	46	3.3	5	12.5	0.6	TKA330M010ST
47	6.94	56	5.0	5	12.5	0.6	TKA470M010ST
68	3.90	70	6.8	6	12.5	0.6	TKA680M010ST
100	3.26	93	10.0	6	16	0.6	TKA101M010ST
150	1.77	128	15.0	6	16	0.6	TKA151M010ST
220	1.48	177	22.0	8	16	0.6	TKA221M010ST
330	0.99	223	33.0	8	16	0.6	TKA331M010ST
470	0.67	267	47.0	8	20	0.6	TKA471M010ST
680	0.39	355	68.0	8	20	0.6	TKA681M010ST
1,000	0.33	488	100.0	10	20	0.6	TKA102M010ST
1,500	0.26	610	150.0	10	25	0.6	TKA152M010ST
2,200	0.15	783	220.0	13	25	0.6	TKA222M010ST
3,300	0.10	1077	330.0	13	30	0.6	TKA332M010ST
4,700	0.08	1483	470.0	16	30	0.8	TKA472M010ST
16 WVDC; 20 VDC Surge							
0.47	282.00	7	4.0	5	12.5	0.6	TKAR47M016ST
22	10.30	41	4.0	5	12.5	0.6	TKA220M016ST
33	6.84	51	5.3	6	12.5	0.6	TKA330M016ST
47	4.80	61	7.5	6	12.5	0.6	TKA470M016ST
68	3.32	77	10.9	6	16	0.6	TKA680M016ST
100	2.76	101	16.0	6	16	0.6	TKA101M016ST
150	1.50	234	24.0	8	16	0.6	TKA151M016ST
220	1.27	177	35.2	8	16	0.6	TKA221M016ST
330	0.85	242	52.8	8	20	0.6	TKA331M016ST
470	0.53	329	75.2	10	16	0.6	TKA471M016ST
680	0.33	425	108.8	10	20	0.6	TKA681M016ST
1,000	0.21	572	180.0	10	25	0.6	TKA102M016ST
1,500	0.16	714	240.0	13	25	0.6	TKA152M016ST
2,200	0.11	912	352.0	13	30	0.6	TKA222M016ST
3,300	0.10	1215	528.0	16	30	0.8	TKA332M016ST
4,700	0.07	1585	752.0	16	40	0.8	TKA472M016ST
25 WVDC; 32 VDC Surge							
0.47	282.18	7	4.0	5	12.5	0.6	TKAR47M025ST
15	13.27	33	4.0	5	12.5	0.6	TKA150M025ST
22	10.50	44	5.5	6	12.5	0.6	TKA220M025ST
33	6.70	54	8.2	6	12.5	0.6	TKA330M025ST
47	4.70	73	11.7	6	12.5	0.6	TKA470M025ST
68	2.83	94	17.0	6	16	0.6	TKA680M025ST
100	2.21	127	25.0	8	16	0.6	TKA101M025ST
150	1.33	162	37.5	8	16	0.6	TKA151M025ST
220	1.01	210	55.0	8	20	0.6	TKA221M025ST
330	0.67	291	82.5	10	16	0.6	TKA331M025ST
470	0.47	384	117.5	10	20	0.6	TKA471M025ST
680	0.37	241	170.0	10	25	0.6	TKA681M025ST
1,000	0.22	672	250.0	13	25	0.6	TKA102M025ST
1,500	0.14	850	375.0	13	30	0.6	TKA152M025ST
2,200	0.11	1099	550.0	16	30	0.8	TKA222M025ST
3,300	0.09	1483	825.0	16	40	0.8	TKA332M025ST
4,700	0.07	1498	1175.0	18	40	0.8	TKA472M025ST

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	d	Catalog Number
35 WVDC; 44 VDC Surge							
0.47	282.18	7	3.0	5	12.5	0.6	TKAR47M035ST
6.8	23.42	25	3.0	5	12.5	0.6	TKA6R8M035ST
10	17.68	30	3.5	5	12.5	0.6	TKA100M035ST
15	10.62	38	5.3	6	12.5	0.6	TKA150M035ST
22	8.04	49	7.7	6	12.5	0.6	TKA220M035ST
33	5.54	69	11.6	6	16	0.6	TKA330M035ST
47	3.76	82	16.5	6	16	0.6	TKA470M035ST
68	2.34	112	23.8	8	16	0.6	TKA680M035ST
100	1.77	158	35.0	8	16	0.6	TKA101M035ST
150	1.06	203	52.5	8	20	0.6	TKA151M035ST
220	0.80	266	77.0	10	16	0.6	TKA221M035ST
330	0.54	359	115.5	10	20	0.6	TKA331M035ST
470	0.38	467	164.5	10	25	0.6	TKA471M035ST
680	0.23	605	238.0	13	25	0.6	TKA681M035ST
1,000	0.18	816	350.0	13	30	0.6	TKA102M035ST
1,500	0.12	951	525.0	16	30	0.8	TKA152M035ST
2,200	0.09	1140	770.0	16	40	0.8	TKA222M035ST
3,300	0.07	1350	1155.0	18	40	0.8	TKA332M035ST
4,700	0.06	1550	1645.0	22	40	0.8	TKA472M035ST
50 WVDC; 63 VDC Surge							
4.7	28.23	23	3.0	5	12.5	0.6	TKA4R7M050ST
10	14.74	33	5.0	6	12.5	0.6	TKA100M050ST
15	8.85	45	7.5	6	12.5	0.6	TKA150M050ST
22	6.70	61	11.0	6	16	0.6	TKA220M050ST
33	4.47	75	16.5	6	16	0.6	TKA330M050ST
47	3.14	106	23.5	8	16	0.6	TKA470M050ST
68	1.95	133	34.0	8	16	0.6	TKA680M050ST
100	1.47	174	50.0	8	20	0.6	TKA101M050ST
150	0.88	235	75.0	10	16	0.6	TKA151M050ST
220	0.67	321	110.0	10	20	0.6	TKA221M050ST
330	0.45	424	165.0	10	25	0.6	TKA331M050ST
470	0.31	554	235.0	13	25	0.6	TKA471M050ST
680	0.20	735	340.0	13	30	0.6	TKA681M050ST
1,000	0.15	1011	500.0	16	30	0.8	TKA102M050ST
1,500	0.10	1119	750.0	16	40	0.8	TKA152M050ST
2,200	0.08	1270	1100.0	18	40	0.8	TKA222M050ST
3,300	0.06	1430	1650.0	22	40	0.8	TKA332M050ST
4,700	0.06	3230	2350.0	22	40	0.8	TKA472M050ST
63 WVDC; 79 VDC Surge							
4.7	31.40	25	3.0	6	12.5	0.6	TKA4R7M063ST
10	14.70	36	6.3	6	12.5	0.6	TKA100M063ST
15	8.85	120	9.5	6	16	0.6	TKA150M063ST
22	6.70	61	13.9	6	16	0.6	TKA220M063ST
33	4.47	89	20.8	8	16	0.6	TKA330M063ST
47	3.14	117	29.6	8	16	0.6	TKA470M063ST
68	1.85	263	42.8	8	20	0.6	TKA680M063ST
100	1.47	196	63.0	10	16	0.6	TKA101M063ST
150	0.88	460	94.5	10	20	0.6	TKA151M063ST
220	0.67	346	138.6	10	25	0.6	TKA221M063ST
330	0.45	463	207.9	13	25	0.6	TKA331M063ST
470	0.31	597	296.1	13	30	0.6	TKA471M063ST
680	0.20	1020	428.4	16	30	0.8	TKA681M063ST
1,000	0.15	1163	630.0	16	40	0.8	TKA102M063ST
1,500	0.12	1325	945.0	18	40	0.8	TKA152M063ST
2,200	0.08	1320	1386.0	22	40	0.8	TKA222M063ST

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type TKA
Axial Leaded Capacitors

NEW

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	d	Catalog Number
100 WVDC; 125 VDC Surge							
0.47	250.80	7	3.0	5	12.5	0.6	TKAR47M100ST
1	117.90	10	3.0	5	12.5	0.6	TKA010M100ST
2.2	53.59	17	3.0	5	12.5	0.6	TKA2R2M100ST
3.3	35.73	21	3.3	6	12.5	0.6	TKA3R3M100ST
4.7	25.08	25	4.7	6	12.5	0.6	TKA4R7M100ST
6.8	19.82	59	6.8	6	16	0.6	TKA6R8M100ST
10	11.79	45	10.0	6	16	0.6	TKA100M100ST
15	9.12	105	15.0	8	16	0.6	TKA150M100ST
22	5.36	81	22.0	8	16	0.6	TKA220M100ST
33	3.57	99	33.0	8	20	0.6	TKA330M100ST
47	2.51	47	47.0	10	20	0.6	TKA470M100ST
68	1.98	319	68.0	10	20	0.6	TKA680M100ST
100	1.18	255	100.0	10	25	0.6	TKA101M100ST
150	0.91	590	150.0	13	25	0.6	TKA151M100ST
220	0.54	439	220.0	13	30	0.6	TKA221M100ST
330	0.36	620	330.0	16	30	0.8	TKA331M100ST
470	0.25	792	470.0	16	40	0.8	TKA471M100ST
680	0.20	1013	680.0	18	40	0.8	TKA681M100ST
1,000	0.12	1350	1000.0	22	40	0.8	TKA102M100ST
160 WVDC; 200 VDC Surge							
1	266.00	19	101.6	6	16	0.6	TKA010M160ST
2.2	121.00	16	103.5	6	16	0.6	TKA2R2M160ST
3.3	80.40	23	105.3	8	16	0.6	TKA3R3M160ST
4.7	56.50	28	107.5	8	16	0.6	TKA4R7M160ST
6.8	39.03	55	110.8	8	20	0.6	TKA6R8M160ST
10	26.60	47	116.0	8	20	0.6	TKA100M160ST
15	20.60	91	124.0	8	20	0.6	TKA150M160ST
22	12.10	85	135.2	10	20	0.6	TKA220M160ST
33	8.04	123	152.8	10	25	0.6	TKA330M160ST
47	5.65	159	175.2	13	21	0.6	TKA470M160ST
68	4.47	242	208.8	13	25	0.6	TKA680M160ST
100	2.66	267	260.0	13	30	0.6	TKA101M160ST
150	1.21	378	340.0	16	30	0.8	TKA151M160ST
200 WVDC; 250 VDC Surge							
1	332.00	17	102.5	6	16	0.6	TKA010M200ST
2.2	151.00	30	105.5	6	16	0.6	TKA2R2M200ST
3.3	101.00	40	108.3	8	16	0.6	TKA3R3M200ST
4.7	70.60	50	111.7	8	16	0.6	TKA4R7M200ST
6.8	55.80	60	117.0	8	20	0.6	TKA6R8M200ST
10	33.20	80	125.0	8	20	0.6	TKA100M200ST
15	25.60	105	137.5	10	16	0.6	TKA150M200ST
22	15.10	140	155.0	10	20	0.6	TKA220M200ST
33	10.10	175	182.5	10	25	0.6	TKA330M200ST
47	7.06	215	217.5	13	25	0.6	TKA470M200ST
68	5.58	265	270.0	13	30	0.6	TKA680M200ST
100	3.32	340	350.0	16	30	0.8	TKA101M200ST

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 105°C	Max LC µA 2 Minutes	Size (Millimeters) D Diameter	L Length	d	Catalog Number
250 WVDC; 300 VDC Surge							
1	332.00	11	102.5	6	16	0.6	TKA010M250ST
2.2	151.00	19	105.5	8	16	0.6	TKA2R2M250ST
3.3	101.00	23	108.3	8	16	0.6	TKA3R3M250ST
4.7	70.60	32	111.7	8	20	0.6	TKA4R7M250ST
6.8	55.80	70	117.0	10	16	0.6	TKA6R8M250ST
10	33.20	57	125.0	10	16	0.6	TKA100M250ST
15	25.60	110	137.5	10	20	0.6	TKA150M250ST
22	15.10	101	155.0	10	25	0.6	TKA220M250ST
33	10.10	133	182.5	13	21	0.6	TKA330M250ST
47	7.06	184	217.5	13	25	0.6	TKA470M250ST
100	3.32	324	350.0	16	33	0.8	TKA101M250ST
150	1.34	475	475.0	16	40	0.8	TKA151M250ST
350 WVDC; 400 VDC Surge							
1	332.00	13	103.0	8	16	0.6	TKA010M350ST
2.2	151.00	19	107.0	8	16	0.6	TKA2R2M350ST
3.3	101.00	26	111.0	8	20	0.6	TKA3R3M350ST
4.7	70.60	36	116.0	10	20	0.6	TKA4R7M350ST
10	33.20	62	135.0	10	20	0.6	TKA100M350ST
15	25.60	153	152.5	10	25	0.6	TKA150M350ST
22	15.10	109	177.0	13	21	0.6	TKA220M350ST
33	10.10	154	215.0	13	25	0.6	TKA330M350ST
47	7.06	197	264.0	13	30	0.6	TKA470M350ST
100	3.32	351	450.0	16	40	0.8	TKA101M350ST
150	1.34	474	625.0	18	40	0.8	TKA151M350ST
400 WVDC; 450 VDC Surge							
1	331.74	17	104.0	8	16	0.6	TKA010M400ST
2.2	150.79	30	108.8	8	20	0.6	TKA2R2M400ST
3.3	100.53	39	113.2	10	20	0.6	TKA3R3M400ST
4.7	70.58	51	118.8	10	25	0.6	TKA4R7M400ST
6.8	48.79	66	127.2	10	25	0.6	TKA6R8M400ST
10	33.17	89	140.0	10	25	0.6	TKA100M400ST
15	22.12	124	160.0	10	21	0.6	TKA150M400ST
22	15.05	175	188.0	13	25	0.6	TKA220M400ST
33	10.05	241	232.0	13	30	0.6	TKA330M400ST
47	7.06	318	288.0	16	30	0.8	TKA470M400ST
68	5.58	412	372.0	16	40	0.8	TKA680M400ST
100	3.32	555	500.0	18	40	0.8	TKA101M400ST
450 WVDC; 500 VDC Surge							
1	331.70	11	104.5	8	16	0.6	TKA010M450ST
2.2	150.80	19	109.9	8	20	0.6	TKA2R2M450ST
3.3	100.50	27	114.9	10	20	0.6	TKA3R3M450ST
4.7	70.58	35	121.2	10	25	0.6	TKA4R7M450ST
10	33.17	60	145.0	13	21	0.6	TKA100M450ST
22	15.08	104	199.0	13	30	0.6	TKA220M450ST
33	10.05	148	248.5	16	30	0.8	TKA330M450ST
47	7.06	311	311.5	13	33	0.8	TKA470M450ST
100	3.32	550	550.0	22	40	0.8	TKA101M450ST

Type NPA
Axial Leaded Capacitors

NEW

MALLORY

NPA parts are available taped and reeled. See page 136 for details.

- 85°C Non-Polar
- Axial Leads
- Small Size
- Suitable For Use in Circuits Where Polarity is Unknown or Reversed Such as Signal Coupling Circuits & Speakers

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
16 WVNP to 100 WVNP

Capacitance Range:
0.47 μF to 1000 μF

Capacitance Tolerance:
±20%

DC Leakage Current:
I = 0.03CV or 3 μA whichever is greater after 5 minutes
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

QA Stability Test:
Apply WVNP for 1,000 hrs at 85°C

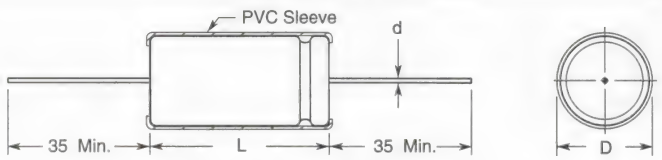
- Capacitance change ±20% of initial limits
- DC leakage current meets initial limits
- ESR ≤200% of initial measured value

Dissipation Factor:

Rated Voltage (V)	16	25	35	50	63	100
Tanδ	0.22	0.20	0.20	0.14	0.12	0.10

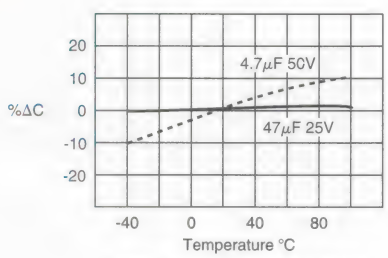
For Capacitance of more than 1,000μF, add 0.002 for every increase of 1,000μF at 120Hz/20°C

Outline Dimensions
(Millimeters)

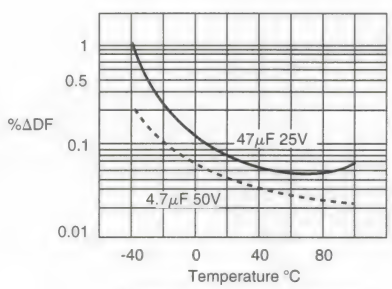


Vinyl sleeve adds .5 Max. to diameter and 2.0 Max. to length.

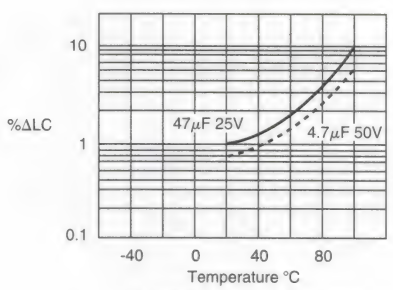
Temperature Characteristics



Capacitance Change Ratio

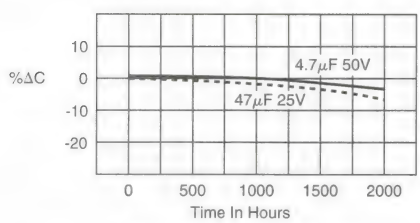


Dissipation Factor Change

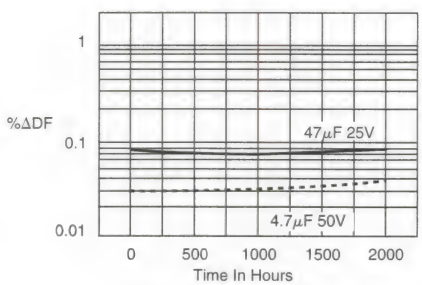


Leakage Current Change

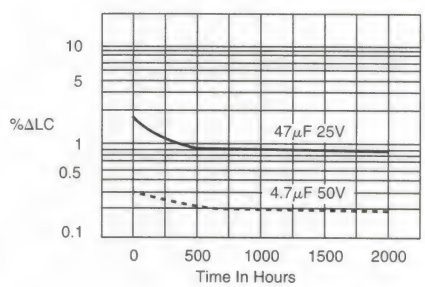
Load Life Characteristics



Capacitance Change Ratio



Dissipation Factor Change



Leakage Current Change

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400

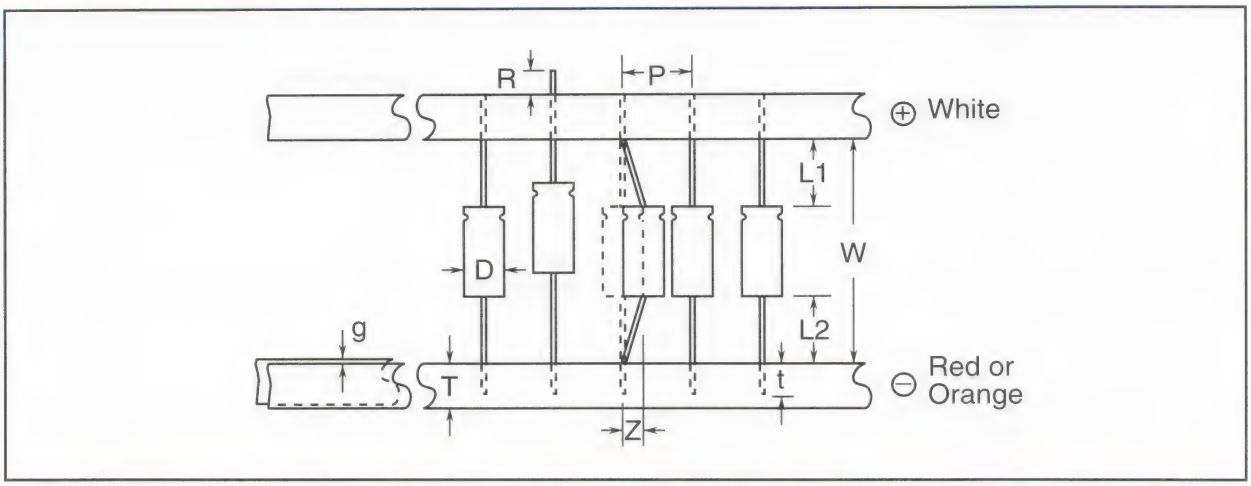
Type NPA
Axial Leaded Capacitors

NEW

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 5 Minutes	Size (Millimeters) D Diameter	L Length	d	Catalog Number
16 WVNP; 20 VNP Surge							
0.47	451.40	9	4.0	6	16	0.6	NPAR47M016ST
1	212.20	12	4.0	6	16	0.6	NPA010M016ST
2.2	96.40	18	4.0	6	16	0.6	NPA2R2M016ST
3.3	64.30	23	4.0	6	16	0.6	NPA3R3M016ST
4.7	45.10	27	4.0	6	16	0.6	NPA4R7M016ST
10	21.50	40	4.8	6	16	0.6	NPA100M016ST
15	14.10	49	7.2	6	16	0.6	NPA150M016ST
22	9.60	60	10.0	6	16	0.6	NPA220M016ST
33	6.40	85	16.0	8	16	0.6	NPA330M016ST
47	7.76	110	23.0	8	16	0.6	NPA470M016ST
68	5.36	155	33.0	8	16	0.6	NPA680M016ST
100	3.65	175	48.0	8	20	0.6	NPA101M016ST
150	1.40	243	72.0	10	20	0.6	NPA151M016ST
220	0.90	220	105.0	10	20	0.6	NPA221M016ST
330	1.11	450	158.0	10	25	0.6	NPA331M016ST
470	0.78	565	226.0	10	30	0.6	NPA471M016ST
1,000	0.36	950	480.0	13	30	0.6	NPA102M016ST
25 WVNP; 32 VNP Surge							
0.47	451.40	9	4.0	6	16	0.6	NPAR47M025ST
1	212.20	12	4.0	6	16	0.6	NPA010M025ST
2.2	96.40	18	4.0	6	16	0.6	NPA2R2M025ST
3.3	64.30	23	4.0	6	16	0.6	NPA3R3M025ST
4.7	45.10	27	4.0	6	16	0.6	NPA4R7M025ST
10	21.20	46	7.5	6	16	0.6	NPA100M025ST
15	22.10	73	11.0	6	16	0.6	NPA150M025ST
22	15.07	88	17.0	6	16	0.6	NPA220M025ST
33	10.05	120	25.0	8	16	0.6	NPA330M025ST
47	7.05	140	35.0	8	16	0.6	NPA470M025ST
68	3.10	151	51.0	10	20	0.6	NPA680M025ST
100	3.32	235	75.0	10	20	0.6	NPA101M025ST
150	1.40	266	112.5	10	20	0.6	NPA151M025ST
220	1.51	390	165.0	10	25	0.6	NPA221M025ST
330	1.00	555	247.0	13	30	0.6	NPA331M025ST
470	0.71	665	352.0	13	30	0.6	NPA471M025ST
35 WVNP; 44 VNP Surge							
0.47	472.60	11	3.5	6	16	0.6	NPAR47M035ST
1	222.15	16	3.5	6	16	0.6	NPA010M035ST
2.2	101.00	24	3.7	6	16	0.6	NPA2R2M035ST
3.3	67.32	30	4.5	6	16	0.6	NPA3R3M035ST
4.7	47.24	37	5.5	6	16	0.6	NPA4R7M035ST
10	20.63	68	10.5	6	16	0.6	NPA100M035ST
15	12.50	92	15.1	6	16	0.6	NPA150M035ST
22	4.38	116	19.8	6	16	0.6	NPA220M035ST
33	6.25	143	34.7	8	16	0.6	NPA330M035ST
47	4.14	197	49.4	8	20	0.6	NPA470M035ST
68	3.31	239	71.6	10	20	0.6	NPA680M035ST
100	2.06	302	105.0	10	20	0.6	NPA101M035ST
150	1.49	425	170.0	10	25	0.6	NPA151M035ST
220	0.94	549	231.0	10	30	0.6	NPA221M035ST
330	0.63	723	346.5	13	30	0.6	NPA331M035ST
470	0.44	892	493.5	13	30	0.6	NPA471M035ST

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple mA 120Hz 85°C	Max LC µA 5 Minutes	Size (Millimeters) D Diameter	L Length	d	Catalog Number
50 WVNP; 63 VNP Surge							
0.47	493.80	13	3.0	6	16	0.6	NPAR47M050ST
1	232.10	19	3.0	6	16	0.6	NPA010M050ST
2.2	105.50	30	3.3	6	16	0.6	NPA2R2M050ST
3.3	70.33	37	5.0	6	16	0.6	NPA3R3M050ST
4.7	49.38	46	7.0	6	16	0.6	NPA4R7M050ST
10	23.21	68	15.0	6	16	0.6	NPA100M050ST
15	10.60	72	10.6	8	16	0.6	NPA150M050ST
22	10.55	120	33.0	8	16	0.6	NPA220M050ST
33	7.03	145	49.0	8	20	0.6	NPA330M050ST
47	4.94	200	70.0	10	20	0.6	NPA470M050ST
68	3.41	260	102.0	10	25	0.6	NPA680M050ST
100	2.32	325	150.0	10	25	0.6	NPA101M050ST
150	1.00	379	225.0	13	30	0.6	NPA151M050ST
220	1.06	600	330.0	13	30	0.6	NPA221M050ST
330	0.70	730	495.0	16	30	0.8	NPA331M050ST
470	0.49	860	705.0	16	40	0.8	NPA471M050ST
63 WVNP; 79 VNP Surge							
0.47	313.50	13	3.0	6	16	0.6	NPAR47M063ST
1	218.84	20	3.0	6	16	0.6	NPA010M063ST
2.2	99.47	31	4.0	6	16	0.6	NPA2R2M063ST
3.3	44.66	46	6.0	6	16	0.6	NPA3R3M063ST
4.7	31.35	55	8.8	6	16	0.6	NPA4R7M063ST
10	14.74	93	18.9	6	16	0.6	NPA100M063ST
15	9.82	114	34.1	8	16	0.6	NPA150M063ST
22	6.70	159	41.5	8	20	0.6	NPA220M063ST
33	4.46	195	62.3	10	20	0.6	NPA330M063ST
47	3.14	245	88.8	10	25	0.6	NPA470M063ST
68	2.17	327	153.5	10	30	0.6	NPA680M063ST
100	1.47	438	189.0	13	25	0.6	NPA101M063ST
150	0.98	557	282.0	13	30	0.6	NPA151M063ST
100 WVNP; 125 VNP Surge							
1	165.80	25	3.0	6	16	0.6	NPA010M100ST
2.2	75.36	36	6.6	6	16	0.6	NPA2R2M100ST
3.3	50.24	46	9.9	6	16	0.6	NPA3R3M100ST
4.7	35.27	55	14.1	6	16	0.6	NPA4R7M100ST
10	16.58	92	30.0	8	16	0.6	NPA100M100ST
15	12.06	124	82.5	8	20	0.6	NPA150M100ST
22	7.54	155	66.0	10	20	0.6	NPA220M100ST
33	5.02	210	99.0	10	25	0.6	NPA330M100ST
47	3.53	285	141.0	13	25	0.6	NPA470M100ST
68	3.01	371	205.0	13	30	0.6	NPA680M100ST
100	1.66	500	300.0	13	30	0.6	NPA101M100ST

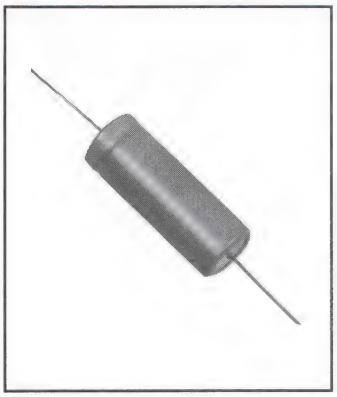


Item	Symbol	Dimensions Ø5 ~ Ø10	Tolerance
Inside Tape Spacing	W	52, 63, 73	±1.5
Lead Wire Protrusion	R	0.5	max.
Pitch of Components	P	Ø5~8: 10 Ø10: 15	±0.5
Lead Flexing	Z	1.2	max.
Body Deviation	L1-L2	1.5	max.
Adhesive length for Lead Wire	t	3.2	min.
Adhesive Tape Width	T	6	±0.5
Adhesive Tape Border	g	0.8	max.

Tape And Reel Quantities	
Case Diameter (D) mm	Reel Quantity (pcs.)
5	1500
6	1250
6.3	1250
8	1000
10	500

Type TC
Axial Leaded Capacitors

MALLORY



- 85°C General Purpose
- Axial Leads for Low Profile Mounting
- Long Life
- High Reliability with High Ripple, Suitable for Consumer Electronic Equipment

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
16 WVDC to 450 WVDC

Capacitance Range:
1 μF to 5,000 μF

Capacitance Tolerance:
.625 diameter & larger:
6 to150 WVDC -10% +75%
Over 150 WVDC -10% +50%
Under .625 Dia. ±20%

DC Leakage Current:
$I = 6\sqrt{CV}$ after 5 minutes
Not to exceed 3 mA @ 25°C
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

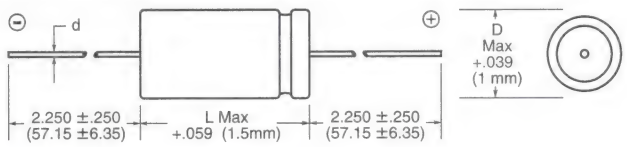
QA Stability Test:
Apply WVDC for 1,000 hrs at 85°C
- Capacitance change ±15% from initial limits
- DC leakage current meets initial limits
- ESR ≤150% of initial measured value

The maximum ripple current at 85°C and 120 Hz for TC capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables:

Rated WVDC	Ripple Multipliers			
	60 Hz	400 Hz	1000 Hz	2400 Hz
0 to 50	0.8	1.05	1.10	1.14
51 to 150	0.8	1.08	1.13	1.16
151 & up	0.8	1.15	1.21	1.25

Ambient Temperature	Ripple Multiplier
+85°C	1.0
+75°C	1.4
+65°C	1.7
+55°C	2.0
+45°C	2.2

Outline Dimensions



For diameters less than .625 (15.88) lead lengths are 1.378 (35.0) Minimum.

Parts are supplied with PVC insulating sleeve. Add .010" to diameter and .125" max to length to allow for insulation.

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
16 WVDC; 20 VDC Surge						
3,000	0.11	2.066	0.875	1.625	0.040	TC1530
4,000	0.08	2.518	0.875	1.875	0.040	TC1540
4,000	0.07	1.450	0.866	1.575	0.040	TC1540A
5,000	0.07	3.217	0.875	2.625	0.040	TC1550
25 WVDC; 30 VDC Surge						
470	0.38	0.550	0.394	0.787	0.032	TC2505A
1,500	0.14	1.881	0.750	2.125	0.040	TC2515
1,500	0.12	1.225	0.709	1.575	0.040	TC2515A
2,000	0.11	2.204	0.875	1.875	0.040	TC2520
2,000	0.09	1.350	0.866	1.575	0.040	TC2520A
3,000	0.07	3.108	0.875	2.625	0.040	TC2530
4,000	0.06	3.779	1.000	2.625	0.040	TC2540
4,000	0.07	1.450	0.866	1.575	0.040	TC2540A
5,000	0.05	4.136	1.000	2.625	0.040	TC2550
50 WVDC; 65 VDC Surge						
22	6.09	0.073	0.236	0.630	0.032	TC36A
47	3.14	0.130	0.315	0.630	0.032	TC39A
1,000	0.08	2.949	0.875	2.625	0.040	TC50100
1,000	0.12	1.447	0.866	1.575	0.040	TC50100A
1,500	0.07	3.423	1.000	2.625	0.040	TC50150
2,000	0.07	3.448	1.000	2.625	0.040	TC50200
2,000	0.09	1.350	0.866	1.575	0.040	TC50200A
3,000	0.05	4.766	1.000	3.625	0.040	TC50300
5,000	0.03	5.820	1.000	3.625	0.040	TC50500
5,000	0.56	3.305	0.866	1.575	0.040	TC50500A

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length		Catalog Number
75 WVDC; 95 VDC Surge						
100	0.77	0.597	0.625	1.375	0.040	TC75101
100	2.66	0.270	0.512	1.181	0.032	TC75101A
250	0.37	1.024	0.750	1.625	0.040	TC75251
500	0.19	1.765	0.875	2.125	0.040	TC75501
1,000	0.10	2.344	1.000	1.625	0.040	TC75102
2,000	0.05	3.991	1.000	2.625	0.040	TC75202
100 WVDC; 125 VDC Surge						
100	0.36	0.974	0.750	1.375	0.040	TC10101
100	3.32	0.419	0.630	1.299	0.032	TC10101A
150	0.24	1.276	0.750	1.625	0.040	TC10151
150	1.34	0.823	0.709	1.575	0.040	TC10151A
250	0.15	1.885	0.875	1.875	0.040	TC10251
500	0.08	3.251	1.000	2.625	0.040	TC10501
1,000	0.08	3.918	1.000	3.875	0.040	TC10102
1,000	0.12	1.447	0.866	1.575	0.040	TC10102A
1,500	0.06	4.495	1.000	3.625	0.040	TC10152
150 WVDC; 175 VDC Surge						
80	1.96	0.670	0.750	1.625	0.040	TC492
100	0.70	0.748	0.750	1.625	0.040	TC493
100	3.32	0.555	0.709	1.575	0.040	TC493A
150	0.47	0.993	0.875	1.625	0.040	TC495
200	0.35	1.293	0.875	2.125	0.040	TC496
300	0.24	1.687	1.000	2.125	0.040	TC499
500	0.15	2.362	1.000	2.625	0.040	TC4990

Type TC
Axial Leaded Capacitors

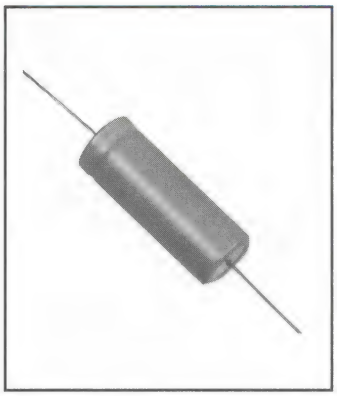
MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
250 WVDC; 300 VDC Surge						
5	70.60	0.060	0.394	0.787	0.032	TC50XA
8	15.27	0.197	0.625	1.125	0.032	TC51
10	12.22	0.220	0.625	1.125	0.032	TC52
10	33.20	0.890	0.394	0.984	0.032	TC52A
12	8.65	0.262	0.625	1.125	0.032	TC53
16	7.64	0.304	0.625	1.375	0.032	TC54
20	6.13	0.345	0.750	1.125	0.040	TC55
20	15.10	0.175	0.512	1.181	0.032	TC55A
30	4.09	0.461	0.750	1.375	0.040	TC57
30	10.10	0.241	0.630	1.181	0.032	TC57A
40	2.69	0.573	0.750	1.625	0.040	TC58
40	8.58	0.280	0.630	1.299	0.032	TC58A
50	2.15	0.640	0.750	1.625	0.040	TC59
50	7.06	0.318	0.630	1.299	0.032	TC59A
100	1.08	1.220	0.875	2.625	0.040	TC1265
100	3.32	0.555	0.866	1.575	0.040	TC1265A
160	0.30	1.649	1.000	2.625	0.040	TC1266
225	0.22	2.105	1.000	3.125	0.040	TC1267
300 WVDC; 350 VDC Surge						
150	0.36	1.624	1.000	3.125	0.040	TC593
200	0.28	1.865	1.000	3.125	0.040	TC594
350 WVDC; 400 VDC Surge						
5	30.48	0.139	0.625	1.125	0.032	TC60
8	19.05	0.193	0.625	1.375	0.032	TC61
8	33.20	0.089	0.512	0.827	0.032	TC61A
10	15.25	0.215	0.625	1.375	0.032	TC62
10	33.20	0.089	0.512	0.827	0.032	TC62A
12	12.71	0.239	0.750	1.125	0.040	TC63
16	9.54	0.302	0.750	1.375	0.040	TC64
20	7.63	0.337	0.750	1.375	0.040	TC65
20	15.10	0.175	0.512	1.181	0.032	TC65A
40	3.96	0.514	0.875	1.625	0.040	TC67
60	2.78	0.691	0.875	2.125	0.040	TC68
60	6.44	0.376	0.709	1.575	0.040	TC68A
100	1.35	1.093	0.875	2.625	0.040	TC69
100	3.32	0.555	0.866	1.575	0.040	TC69A
150	0.96	1.495	1.000	3.625	0.040	TC692

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
450 WVDC; 525 VDC Surge						
2	86.91	0.082	0.625	1.125	0.032	TC695
2	151.00	0.030	0.315	0.787	0.032	TC695A
4	43.47	0.116	0.625	1.125	0.032	TC697
4	70.60	0.051	0.394	0.984	0.032	TC697A
5	35.86	0.144	0.750	1.125	0.040	TC70
5	70.60	0.051	0.394	0.984	0.032	TC70A
8	21.74	0.183	0.750	1.125	0.040	TC71
8	33.20	0.089	0.512	0.827	0.032	TC71A
10	17.39	0.243	0.875	1.375	0.040	TC72
10	33.20	0.089	0.512	0.827	0.032	TC72A
12	14.50	0.267	0.875	1.375	0.040	TC73
16	10.88	0.304	0.750	1.625	0.040	TC74
16	24.15	0.140	0.512	0.984	0.032	TC74A
20	8.71	0.371	0.875	1.625	0.040	TC75
20	15.10	0.175	0.512	1.181	0.032	TC75A
30	5.82	0.488	1.000	1.625	0.040	TC77
30	10.10	0.241	0.630	1.181	0.032	TC77A
40	4.36	0.653	1.000	2.125	0.040	TC78
40	8.58	0.280	0.630	1.299	0.032	TC78A
50	3.06	0.709	1.000	2.125	0.040	TC79
50	7.06	0.318	0.630	1.299	0.032	TC79A
60	2.55	0.855	1.000	2.625	0.040	TC795
80	2.19	1.068	1.000	3.125	0.040	TC80
80	3.32	0.555	0.866	1.575	0.040	TC80A
100	1.97	1.178	1.000	3.125	0.040	TC807
100	3.32	0.555	0.866	1.575	0.040	TC807A

Type TCG
Axial Leaded Capacitors

MALLORY



- 85°C Industrial Grade
- Computer Grade Quality
- 1000 Hours Load Life at Rated Temperature
- Axial Leads for Low Profile Mounting
- Ideal for Computers, Communication Equipment, and Power Supplies

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +85°C

Voltage Range:
10 WVDC to 450 WVDC

Capacitance Range:
10 μF to 10,000 μF

Capacitance Tolerance:
6 to150 WVDC - 10% +75%
Over 150 WVDC - 10% +50%

DC Leakage Current:
$I = 6\sqrt{CV}$ after 5 minutes
Not to exceed 3 mA @ 25°C
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

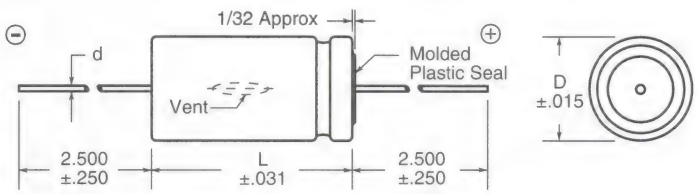
QA Stability Test:
Apply WVDC for 1,000 hrs at 85°C
- Capacitance change ±15% from initial limits
- DC leakage current meets initial limits
- ESR ≤150% of initial measured value

The maximum ripple current at 85°C and 120 Hz for TCG capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables:

Rated WVDC	Ripple Multipliers			
	60 Hz	400 Hz	1000 Hz	2400 Hz
0 to 50	0.8	1.05	1.10	1.14
51 to 150	0.8	1.08	1.13	1.16
151 & up	0.8	1.15	1.21	1.25

Ambient Temperature	Ripple Multiplier
+85°C	1.0
+75°C	1.4
+65°C	1.7
+55°C	2.0
+45°C	2.2

Outline Dimensions



Parts are supplied with PVC insulating sleeve. Add .010" to diameter and .125" max to length to allow for insulation.

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
6 WVDC; 8 VDC Surge						
9,400	0.050	1.800	0.866	1.575	0.040	TCG942U006A
10 WVDC; 12 VDC Surge						
1,000	3.260	0.180	0.394	0.787	0.032	TCG102M010A
2,500	0.136	1.144	0.512	0.984	0.032	TCG252U010A
2,500	0.170	1.407	0.875	1.125	0.040	TCG252U010L1C
2,500	0.171	1.521	1.000	1.125	0.040	TCG252U010N1C
2,900	0.080	1.345	0.709	1.575	0.040	TCG292U010A
3,500	0.092	2.424	1.000	1.625	0.040	TCG352U010N1L
5,000	0.082	2.488	1.000	1.375	0.040	TCG502U010N1G
5,500	0.081	2.584	1.000	1.625	0.040	TCG552U010N1L
10,000	0.050	1.800	0.866	1.575	0.040	TCG103U010A
10,000	0.046	4.274	0.875	3.125	0.040	TCG103U010L3C
10,000	0.048	3.772	1.000	2.125	0.040	TCG103U010N2C
15 WVDC; 20 VDC Surge						
2,500	0.108	1.055	0.512	1.181	0.032	TCG252U015A
2,500	0.126	1.989	0.625	2.625	0.032	TCG252U015G2L
2,900	0.110	2.134	0.625	2.625	0.032	TCG292U015G2L
4,000	0.068	1.500	0.866	1.575	0.040	TCG402U015A
4,000	0.085	2.518	1.000	1.625	0.040	TCG402U015N1L
4,100	0.068	1.500	0.866	1.575	0.040	TCG412U015A
4,100	0.083	2.544	1.000	1.625	0.040	TCG412U015N1L
5,000	0.067	3.015	0.750	2.625	0.040	TCG502U015J2L
6,300	0.055	3.612	0.875	2.625	0.040	TCG632U015L2L
8,000	0.058	1.617	0.866	1.575	0.040	TCG802U015A
8,000	0.045	4.269	1.000	2.625	0.040	TCG802U015N2L

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
15 WVDC; 20 VDC Surge						
8,200	0.057	1.650	0.866	1.575	0.040	TCG822U015A
8,200	0.044	4.310	1.000	2.625	0.040	TCG822U015N2L
10,000	0.050	1.800	0.866	1.575	0.040	TCG103U015A
10,000	0.038	4.634	1.000	2.625	0.040	TCG103U015N2L
25 WVDC; 30 VDC Surge						
1,000	0.118	1.447	0.866	1.575	0.040	TCG102U025A
1,000	0.216	1.352	1.000	1.125	0.040	TCG102U025N1C
1,100	0.118	1.447	0.866	1.575	0.040	TCG112U025A
1,100	0.190	1.431	0.750	1.625	0.040	TCG112U025J1L
2,000	0.154	2.137	1.000	1.625	0.040	TCG202U025N1L
2,200	0.080	1.300	0.709	1.575	0.040	TCG222U025A
2,200	0.098	2.487	0.750	2.625	0.040	TCG222U025J2L
4,000	0.595	2.402	0.866	1.575	0.040	TCG402U025A
4,000	0.057	3.827	0.875	3.125	0.040	TCG402U025L3C
4,100	0.595	2.402	0.866	1.575	0.040	TCG412U025A
30 WVDC; 40 VDC Surge						
500	0.369	0.874	0.750	1.125	0.040	TCG501U030J1C
1,100	0.147	1.050	0.630	1.181	0.032	TCG112U030A
1,100	0.169	1.721	0.625	2.625	0.032	TCG112U030G2L
2,100	0.080	1.400	0.866	1.575	0.040	TCG212U030A
2,100	0.072	3.159	0.875	2.625	0.040	TCG212U030L2L
2,400	0.130	1.318	0.866	1.575	0.040	TCG242U030A
2,400	0.082	2.961	0.875	2.625	0.040	TCG242U030L2L
2,500	0.078	3.005	1.000	2.625	0.040	TCG252U030N2L
3,000	0.065	3.004	0.875	2.125	0.040	TCG302U030L2C

Type TCG
Axial Leaded Capacitors

MALLORY

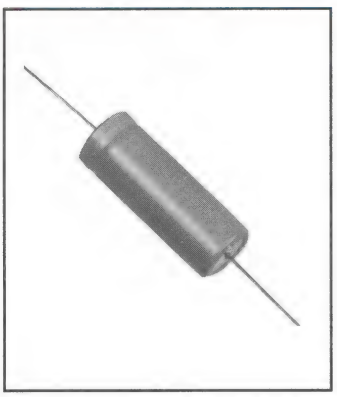
Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
40 WVDC; 50 VDC Surge						
1,200	0.136	1.150	0.709	1.575	0.040	TCG122U040A
2,100	0.080	1.400	0.866	1.575	0.040	TCG212U040A
50 WVDC; 65 VDC Surge						
100	1.179	0.350	0.394	0.984	0.032	TCG101U050A
250	0.610	0.477	0.512	0.984	0.032	TCG251U050A
250	0.499	0.742	0.625	1.375	0.032	TCG251U050G1G
500	0.304	0.770	0.512	1.181	0.032	TCG501U050A
500	0.156	1.788	0.625	2.625	0.032	TCG501U050G2L
500	0.262	1.227	1.000	1.125	0.040	TCG501U050N1C
600	0.243	1.133	0.709	1.575	0.040	TCG601U050A
600	0.211	1.539	0.625	2.625	0.032	TCG601U050G2L
600	0.215	1.363	0.875	1.375	0.040	TCG601U050L1G
880	0.148	1.353	0.866	1.575	0.040	TCG881T050A
1,100	1.050	2.480	1.000	1.375	0.040	TCG112U050N1G
1,100	0.118	1.447	0.866	1.575	0.040	TCG112U050A
1,100	0.094	2.698	1.000	2.125	0.040	TCG112U050N2C
1,200	0.136	1.150	0.709	1.575	0.040	TCG122U050A
1,200	0.110	2.313	0.875	2.125	0.040	TCG122U050L2C
2,300	0.130	1.318	0.866	1.575	0.040	TCG232U050A
2,300	0.062	3.653	1.000	2.625	0.040	TCG232U050N2L
2,500	0.058	3.777	1.000	2.625	0.040	TCG252U050N2L
75 WVDC; 100 VDC Surge						
340	0.357	0.700	0.630	1.181	0.032	TCG341U075A
150 WVDC; 175 VDC Surge						
100	0.696	0.748	0.750	1.625	0.040	TCG101T150J1L
110	0.634	0.784	0.750	1.625	0.040	TCG111T150J1L
250	0.284	1.439	0.875	2.125	0.040	TCG251T150L2C
530	0.139	2.639	1.000	3.125	0.040	TCG531T150N3C
560	0.133	2.705	1.000	3.125	0.040	TCG561T150N3C
200 WVDC; 250 VDC Surge						
30	7.060	0.240	0.512	0.984	0.032	TCG300T200A
210	0.646	1.780	1.000	2.125	0.040	TCG211T200N2C
300	0.517	1.977	1.000	2.125	0.040	TCG301T200N2C
430	0.411	2.116	1.000	3.625	0.040	TCG431U200N3L

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
250 WVDC; 300 VDC Surge						
50	2.450	.607	.875	1.375	.040	TCG500T250L1G
100	1.230	1.039	.875	2.125	.040	TCG101T250L2C
200	.277	1.726	1.000	2.625	.040	TCG201T250N2L
350 WVDC; 400 VDC Surge						
20	15.100	0.175	0.512	1.181	0.032	TCG200T350A
20	9.500	0.294	0.625	1.625	0.032	TCG200T350G1L
20	9.520	0.276	0.750	1.125	0.040	TCG200T350J1C
30	7.060	0.240	0.512	0.984	0.032	TCG300T350A
30	6.336	0.408	0.625	2.125	0.032	TCG300T350G2C
30	6.368	0.369	0.875	1.125	0.040	TCG300T350L1C
40	8.580	0.220	0.512	1.181	0.032	TCG400T350A
40	4.200	0.460	1.000	1.125	0.040	TCG400T350N1C
50	6.850	0.331	0.630	1.299	0.032	TCG500T350A
50	3.353	0.560	1.000	1.375	0.040	TCG500T350N1G
100	3.320	0.555	0.866	1.575	0.040	TCG101T350A
100	1.680	0.957	1.000	2.125	0.040	TCG101T350N2C
160	0.469	1.327	1.000	2.625	0.040	TCG161T350N2L
180	0.417	1.524	1.000	3.125	0.040	TCG181T350N3C
450 WVDC; 525 VDC Surge						
10	33.200	0.089	0.512	0.827	0.032	TCG100T450A
10	17.392	0.217	0.625	1.625	0.032	TCG100T450G1L
10	17.404	0.204	0.750	1.125	0.040	TCG100T450J1C
12	14.500	0.244	0.750	1.375	0.040	TCG120T450J1G
20	15.100	0.175	0.512	1.181	0.032	TCG200T450A
20	8.704	0.384	0.625	2.625	0.032	TCG200T450G2L
20	8.732	0.341	1.000	1.125	0.040	TCG200T450N1C
40	8.580	0.280	0.630	1.299	0.032	TCG400M450A
40	8.580	0.280	0.630	1.299	0.032	TCG400T450A
50	6.850	0.331	0.630	1.299	0.032	TCG500M450A
50	6.850	0.331	0.630	1.299	0.032	TCG500T450A
50	4.742	0.709	1.000	1.625	0.040	TCG500T450N1L
50	4.049	0.548	1.000	2.125	0.040	TCG500T450N2C
60	6.140	0.376	0.709	1.575	0.040	TCG600M450A
60	3.950	0.890	1.000	2.625	0.040	TCG600T450N2L
75	5.080	0.443	0.709	1.575	0.040	TCG750T450A
75	1.980	0.944	1.000	2.125	0.040	TCG750T450N2C
85	1.869	0.998	1.000	2.625	0.040	TCG850T450N2L

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Type TCX
Axial Leaded Capacitors

MALLORY



- 105°C High Performance
- Computer Grade Quality
- 2000 Hours Load Life at Rated Temperature
- Low DCL, Low ESR
- Axial Leads

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +105°C

Voltage Range:
10 WVDC to 150 WVDC

Capacitance Range:
27 μF to 12,000 μF

Capacitance Tolerance:
10 to75 WVDC - 10% +75%
Over 75 WVDC - 10% +50%

DC Leakage Current:
$I = 2\sqrt{CV}$ after 5 minutes
Not to exceed 2mA @ 25°C
C = Capacitance in μF
V = Rated Voltage
I = Leakage Current in μA

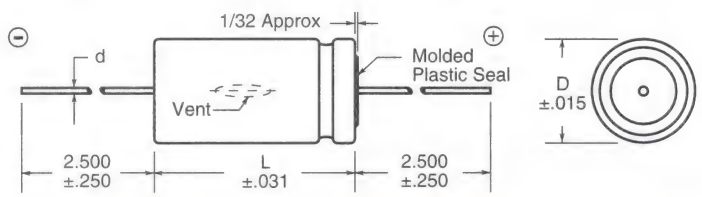
QA Stability Test:
Apply WVDC for 2,000 hrs at 105°C
- Capacitance change ±15% from initial limits
- DC leakage current meets initial limits
- ESR ≤150% of initial measured value

The maximum ripple current at 85°C and 120 Hz for TCX capacitors is shown in the Standard Rating Table. Maximum ripple current may be adjusted by the multipliers in the following tables:

Rated WVDC	Ripple Multipliers			
	60 Hz	400 Hz	1000 Hz	2400 Hz
0 to 150	0.8	1.05	1.10	1.14

Ambient Temperature	Ripple Multiplier
+95°C	0.7
+85°C	1.0
+75°C	1.2
+65°C	1.4
+55°C	1.58
+45°C	1.7

Outline Dimensions



Parts are supplied with PVC insulating sleeve. Add .010" to diameter and .125" max to length to allow for insulation.

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
6 WVDC; 8 VDC Surge						
4,800	0.063	1.550	0.866	1.575	0.040	TCX482U006A
10 WVDC; 12 VDC Surge						
10,000	0.050	1.800	0.866	1.575	0.040	TCX103U010A
10,000	0.024	5.952	0.875	3.125	0.040	TCX103U010L3C
15 WVDC; 20 VDC Surge						
1,000	0.145	1.394	0.750	1.125	0.040	TCX102U015J1C
2,100	0.071	2.337	0.750	1.625	0.040	TCX212U015J1L
3,100	0.625	1.430	0.866	1.575	0.040	TCX312U015A
4,600	0.063	1.550	0.866	1.575	0.040	TCX462U015A
6,200	0.066	1.572	0.866	1.575	0.040	TCX622U015A
8,200	0.060	1.628	0.866	1.575	0.040	TCX822U015A
8,200	0.025	5.796	1.000	2.625	0.040	TCX822U015N2L
12,000	0.050	1.800	0.866	1.575	0.040	TCX123U015A
12,000	0.019	7.589	1.000	3.625	0.040	TCX123U015N3L
20 WVDC; 25 VDC Surge						
640	0.248	0.735	0.512	1.181	0.032	TCX641U020A
25 WVDC; 30 VDC Surge						
640	0.248	0.735	0.512	1.181	0.032	TCX641U025A
1,200	0.118	1.447	0.866	1.575	0.040	TCX122U025A
1,200	0.109	1.899	1.000	1.125	0.040	TCX122U025N1C
1,500	0.140	0.850	0.512	1.181	0.032	TCX152U025A
1,800	0.102	1.268	0.866	1.575	0.040	TCX182U025A
1,800	0.071	2.557	0.875	1.625	0.040	TCX182U025L1L
2,400	0.080	1.320	0.866	1.575	0.040	TCX242U025A

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
25 WVDC; 30 VDC Surge						
2,400	0.057	3.081	1.000	1.625	0.040	TCX242U025N1L
3,700	0.037	4.370	0.875	2.625	0.040	TCX372U025L2L
7,200	0.023	6.882	1.000	3.625	0.040	TCX722U025N3L
30 WVDC; 40 VDC Surge						
310	0.447	0.463	0.512	0.984	0.032	TCX311U030A
310	0.316	0.852	0.625	1.125	0.032	TCX311U030G1C
470	0.314	0.554	0.512	0.984	0.032	TCX471U030A
470	0.214	1.149	0.750	1.125	0.040	TCX471U030J1C
970	0.147	1.163	0.630	1.575	0.032	TCX971U030A
1,400	0.120	1.200	0.709	1.575	0.040	TCX142U030A
1,400	0.075	2.583	0.750	2.125	0.040	TCX142U030J2C
2,700	0.328	1.343	0.866	1.575	0.040	TCX272U030A
2,700	0.043	4.091	0.875	2.625	0.040	TCX272U030L2L
3,000	0.039	4.643	0.875	3.125	0.040	TCX302U030L3C
40 WVDC; 50 VDC Surge						
360	0.419	0.492	0.512	0.984	0.032	TCX361U040A
360	0.230	1.107	0.750	1.125	0.040	TCX361U040J1C
1,000	0.118	1.447	0.866	1.575	0.040	TCX102U040A
1,000	0.088	2.290	0.875	1.625	0.040	TCX102U040L1L
1,400	0.120	1.200	0.709	1.575	0.040	TCX142U040A
1,400	0.063	3.107	0.750	2.625	0.040	TCX142U040J2L
2,100	0.045	3.975	0.875	2.625	0.040	TCX212U040L2L
4,200	0.586	2.587	0.866	1.575	0.040	TCX422U040A
4,200	0.028	6.361	1.000	3.625	0.040	TCX422U040N3L

Type TCX
Axial Leaded Capacitors

MALLORY

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
50 WVDC; 65 VDC Surge						
170	0.804	0.362	0.512	0.984	0.032	TCX171U050A
250	0.486	0.488	0.512	1.181	0.032	TCX251U050A
250	0.306	0.947	0.625	1.375	0.032	TCX251U050G1G
370	0.216	1.250	0.875	1.125	0.040	TCX371U050L1C
500	0.313	0.597	0.512	1.181	0.032	TCX501U050A
500	0.155	1.624	0.625	2.125	0.032	TCX501U050G2C
710	0.191	1.055	0.709	1.575	0.040	TCX711U050A
710	0.118	1.989	1.000	1.375	0.040	TCX711U050N1G
950	0.089	2.456	1.000	1.625	0.040	TCX951U050N1L
1,400	0.120	1.200	0.709	1.575	0.040	TCX142U050A
1,400	0.061	3.436	0.875	2.625	0.040	TCX142U050L2L
1,800	0.102	1.268	0.866	1.575	0.040	TCX182U050A
1,900	0.097	1.281	0.866	1.575	0.040	TCX192U050A
1,900	0.047	4.170	1.000	2.625	0.040	TCX192U050N2L
2,800	0.377	1.357	0.866	1.575	0.040	TCX282U050A
2,800	0.035	5.655	1.000	3.625	0.040	TCX282U050N3L

Cap µF	Max ESR Ohms 120Hz 25°C	Max Ripple Amps 120Hz 85°C	Size (Inches) D Diameter	L Length	d	Catalog Number
75 WVDC; 95 VDC Surge						
65	2.961	0.419	0.625	1.125	0.032	TCX650U075G1C
100	3.320	0.410	0.630	1.181	0.032	TCX101U075A
100	1.932	0.574	0.750	1.125	0.040	TCX101U075J1C
560	0.229	0.887	0.709	1.575	0.040	TCX561U075A
560	0.115	2.491	0.875	2.625	0.040	TCX561U075L2L
740	0.183	1.076	0.709	1.575	0.040	TCX741U075A
740	0.090	3.033	1.000	2.625	0.040	TCX741U075N2L
1,100	0.084	3.633	1.000	3.625	0.040	TCX112U075N3L
100 WVDC; 125 VDC Surge						
110	.404	.996	.875	1.375	.040	TCX111T100L1G
150	.297	1.248	.875	1.625	.040	TCX151T100L1L
150 WVDC; 175 VDC Surge						
27	5.720	.322	.625	1.125	.032	TCX270T150G1C
150	.404	1.224	.750	2.625	.040	TCX151T150J2L

Case Code Format
Types TCG and TCX

Case Code Chart

Case Code	Inches D	Inches L	Millimeters D	Millimeters L	d Inches	d AWG
E1G	.500	1.375	12.7	34.9	.032	#20
E2C	.500	2.125	12.7	53.9	.032	#20
G1C	.625	1.125	15.9	28.6	.032	#20
G1G	.625	1.375	15.9	34.9	.032	#20
G1L	.625	1.625	15.9	41.3	.032	#20
G2C	.625	2.125	15.9	53.9	.032	#20
G2L	.625	2.625	15.9	66.7	.032	#20
G3C	.625	3.125	15.9	79.4	.032	#20
G3L	.625	3.625	15.9	92.1	.032	#20
J1C	.750	1.125	19.1	28.6	.040	#18
J1G	.750	1.375	19.1	34.9	.040	#18
J1L	.750	1.625	19.1	41.3	.040	#18
J2C	.750	2.125	19.1	53.9	.040	#18
J2L	.750	2.625	19.1	66.7	.040	#18
J3C	.750	3.125	19.1	79.4	.040	#18
J3L	.750	3.625	19.1	92.1	.040	#18
L1C	.875	1.125	22.2	28.6	.040	#18
L1G	.875	1.375	22.2	34.9	.040	#18
L1L	.875	1.625	22.2	41.3	.040	#18
L2C	.875	2.125	22.2	53.9	.040	#18
L2L	.875	2.625	22.2	66.7	.040	#18
L3C	.875	3.125	22.2	79.4	.040	#18
L3L	.875	3.625	22.2	92.1	.040	#18
N1C	1.000	1.125	25.4	28.6	.040	#18
NiG	1.000	1.375	25.4	34.9	.040	#18
N1L	1.000	1.625	25.4	41.3	.040	#18
N2C	1.000	2.125	25.4	53.9	.040	#18
N2L	1.000	2.625	25.4	66.7	.040	#18
N3C	1.000	3.125	25.4	79.4	.040	#18
N3L	1.000	3.625	25.4	92.1	.040	#18

Index and General Specifications
Disc Ceramic Capacitors

MALLORY

Class	Capacitance Range	Voltage Range	Insulation Resistance	Dissipation Factor (Max)	Test Frequency	Breakdown Voltage	Page Number
General Purpose	1 to 100,000 pF	50, 100, 500, 1,000 VDC	10,000 megohms (min)	Z5U: 4.0% Y5U: 4.0% Y5V: 5.0% All others: 2.5%	1,000 Hz	2.5 x rated (5 seconds max)	145
EIA class 1 Temp Compensating	1 to 910 pF	50, 500, 1,000 3,000 VDC	10,000 megohms (min)	5.0%	1 MHz	3 x rated (5 seconds max)	148
EIA Class 2 Temp/Freq Stable	100 to 10,000 pF	500 and 1,000 VDC	10,000 megohms (min)	1.5%	1,000 Hz	2.5 x rated (5 seconds max)	151
EIA Class 2 High Voltage	100 to 10,000 pF	2,000 and 3,000 VDC	10,000 megohms (min)	2.5%	1,000 Hz	2.5 x rated (5 seconds max)	151
EIA Class 3 Reduced Titanite High Capacitance	.01 to .22 μF	12, 25, 50 VDC	1 megohm (min)	Y5R: 1.5% Y5U: 7.0% Y5V: 5.0%	1,000 Hz (operating)	2.5 x rated (5 seconds max)	152
Spark-Arrestor	.75 pF max (gap only) to .01μ F	1 - 3 KVDC	n/a	n/a	n/a	n/a	152
X Type U.L., CSA & VDE Recognized Across-The-Line	.001 to .01 μF	125 vrms 60 Hz	>10K megohms @ 25°C, 500 VDC	2.5%	1,000 Hz	3250 min vrms, 60 Hz (1 minute max)	153
NEW **X1-Y1 Type Across the Line**	100pF to .01μF	250 vrms 60 Hz	–	2.0%	–	4000 min vrms	153

CLASS 2 & 3
EIA TEMPERATURE COEFFICIENT CODES

A combination of characters designating capacitance drift over a temperature range.
Example: Y5E could change ±4.7% over a temperature range of -30°C to +85°C.

Letter Symbol	Low Temp Requirement
X	-55°C
Y	-30°C
Z	+10°C

Number Symbol	High Temp Requirement
2	+45°C
4	+65°C
5	+85°C
6	+105°C
7	+125°C

Letter Symbol	Maximum Capacitance Change Over Temp Rating
A	±1.0%
B	±1.5%
C	±2.2%
D	±3.3%
E	±4.7%
F	±7.5%
P	±10.0%
R	±15.0%
S	±22.0%
T	+22%, -33%
U	+22%, -56%
V	+22%, -82%

CLASS 1
TEMPERATURE COEFFICIENT CODES

Temperature Range -55°C +125°C		% Change Per 1°C
NPO-(COG)	±30ppm	.0030%
N330	-330ppm	-.033%
N470	-470ppm	-.047%
N750	-750ppm	-.075%
N1000	-1000ppm	-.10%
N1500	-1500ppm	-.15%
N2200	-2200ppm	-.22%
N3300	-3300ppm	-.33%
N4700	-4700ppm	-.47%
N5600	-5600ppm	-.56%
SL	-750, +100ppm	±.075% Max

Physical Specifications

Case: Conformal Coating

Lead material: Tinned copper wire. (Minimum lead content: 5%)

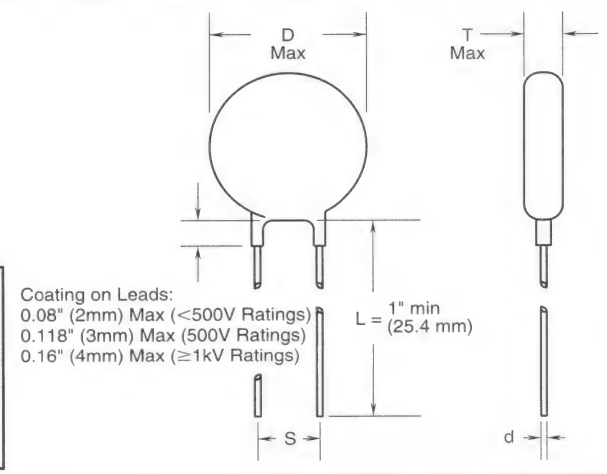
Note: Part numbers with 'X' suffix are multilayer construction rather than disc, and are rectangular in shape.
The diameter dimension is the largest dimension of the footprint.

Tape and Reel Available upon Request
Leads are formed to .200 (5.0mm) lead spacing

For D less than .315 (8.0mm) - Quantity/Reel = 2500 pcs
For D .315 (8.0mm) to .472 (12.0mm) - Quantity/Reel = 2000 pcs

Tape and Reel not available for D greater than .472 (12mm)
Tape and Reel not available for 2000 & 3000 volt parts

Note: Part numbers with 'X' suffix are all available in tape and reel: 2000 pcs per reel

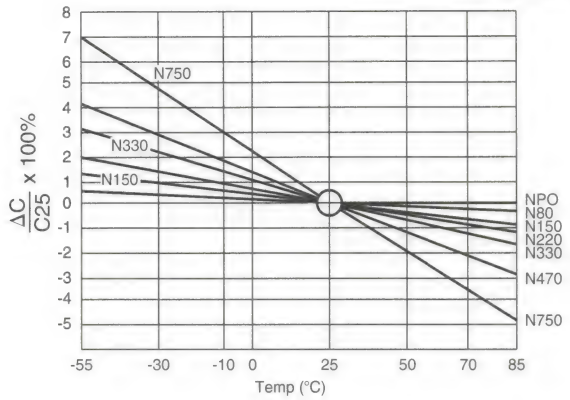


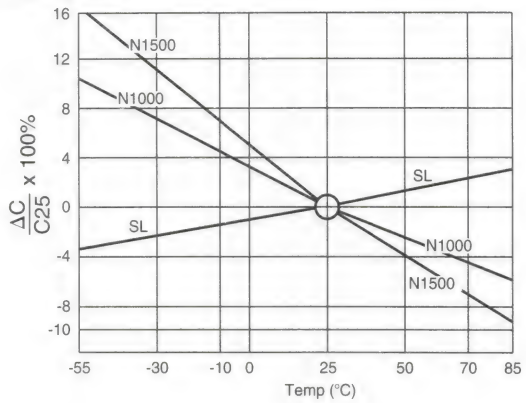
Disc Ceramic Capacitors

MALLORY

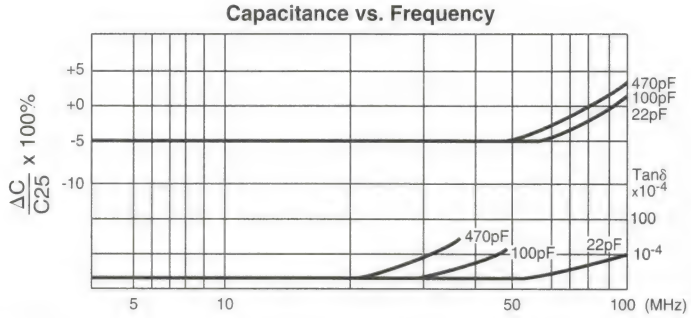
CLASS 1

Capacitance vs. Temperature





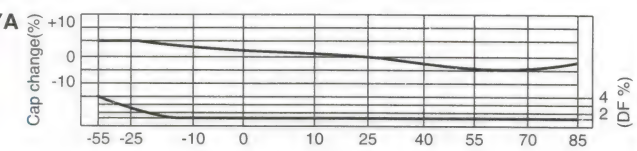
Capacitance vs. Frequency



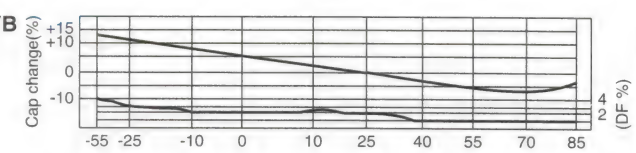
CLASS 2 AND 3

JIS Standard		EIA Standard			
Temp Range -25°C +85°C	Cap Change (%)	Temp Range -25°C +85°C	Cap Change (%)	Temp Range -25°C +85°C	Cap Change (%)
YA	±4.7	Y5D (Special)	±3.3 (50V only)		
		Y5E	±4.7	X5F	±7.5
		Y5F	±7.5		
YB	±8	Y5P	±10	X5R	±15
		Y5R	±15		
		Y5S	±22		
YD	+5 -30	Y5T	+22 -33	X5T	+22 -33
YE	+5 -30	Y5U	+22 -56		
YF	+10 -80	Y5V	+22 -82		
ZF	+10 -80	Z5V	+22 -82		

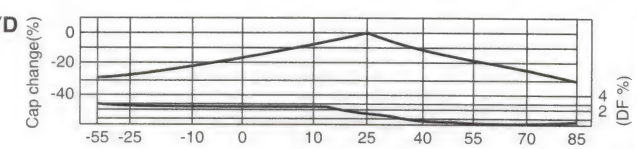
YA



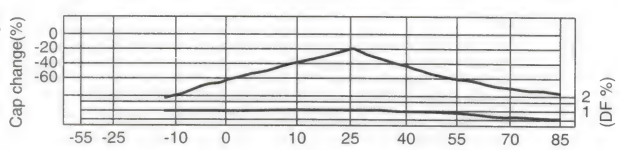
YB



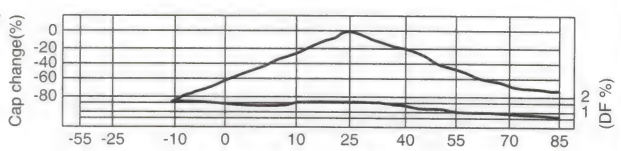
YD



YE

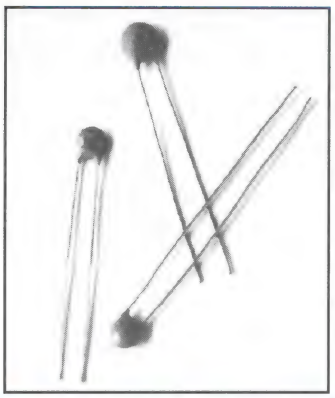


YF



General Purpose
Disc Ceramic Capacitors

MALLORY



- General Purpose
- Ideal For Use in Non-critical Coupling, Bypass and Filter Applications
- Conformally Coated
- Radial Leads

GENERAL SPECIFICATIONS

Temperature Range:
-30°C to +85°C

Voltage Range:
50, 100, 500,
1,000, 2,000, 3,000 WVDC

Capacitance Range:
1 pF to 100,000 pF

Lead Length: 1 inch minimum

Insulation Resistance:
10,000 megohms (min)

Power Factor @ 1kHz:
2.5% Max (Y5V: 5%)

Breakdown Voltage:
2.5 x rated
(5 seconds Max)

50 WVDC

Capacity pF	Tol	Temp Coef	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
1	.25pF	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE010C
3	.25pF	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE030C
5	.25pF	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE050C
6	.5pF	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE060D
7	.5pF	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE070D
8	.5pF	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE080D
10	.5pF	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE100D
12	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE120K
15	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE150K
18	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE180K
20	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE200K
22	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE220K
24	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE240K
27	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE270K
33	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE330K
39	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE390K
47	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE470K
51	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE510K
56	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE560K
68	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE680K
75	10%	SL	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE750K
82	10%	SL	.197	.118	.098	.016	5.0	3.0	2.5	.4	GE820K
91	10%	SL	.197	.118	.098	.016	5.0	3.0	2.5	.4	GE910K
100	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE101K
120	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE121K
150	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE151K
180	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE181K
220	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE221K
270	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE271K
330	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE331K
390	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE391K
470	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE471K
560	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE561K
680	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE681K
820	10%	Y5P	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE821K
1,000	10%	Y5P	.197	.118	.098	.016	5.0	3.0	2.5	.4	GE102K
1,000	20%	Y5T	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE102M
1,000	-20+80	Y5V	.157	.118	.098	.016	4.0	3.0	2.5	.4	GE102Z
1,500	10%	Y5P	.197	.118	.098	.016	5.0	3.0	2.5	.4	GE152K
1,500	20%	Y5T	.197	.118	.098	.016	5.0	3.0	2.5	.4	GE152M
1,800	10%	Y5P	.236	.118	.197	.020	6.0	3.0	5.0	.5	GE182K
2,200	10%	Y5P	.236	.118	.197	.020	6.0	3.0	5.0	.5	GE222K
2,200	20%	Y5U	.197	.118	.098	.016	5.0	3.0	2.5	.4	GE222M
2,700	10%	Y5P	.276	.118	.197	.020	7.0	3.0	5.0	.5	GE272K
3,300	10%	Y5P	.276	.118	.197	.020	7.0	3.0	5.0	.5	GE332K
3,300	20%	Y5U	.236	.118	.197	.020	6.0	3.0	5.0	.5	GE332M
3,900	10%	Y5P	.315	.118	.197	.020	8.0	3.0	5.0	.5	GE392K
4,700	10%	Y5P	.315	.118	.197	.020	8.0	3.0	5.0	.5	GE472K
4,700	20%	Y5U	.236	.118	.197	.020	6.0	3.0	5.0	.5	GE472M
4,700	-20+80	Y5U	.236	.118	.197	.020	6.0	3.0	5.0	.5	GE472Z
5,600	10%	Y5P	.354	.118	.197	.020	9.0	3.0	5.0	.5	GE562K
6,800	10%	Y5P	.374	.118	.197	.020	9.5	3.0	5.0	.5	GE682K
6,800	20%	Y5U	.276	.118	.197	.020	7.0	3.0	5.0	.5	GE682M
8,200	10%	Y5P	.394	.118	.197	.020	10.0	3.0	5.0	.5	GE822K
10,000	10%	Y5P	.472	.118	.197	.020	12.0	3.0	5.0	.5	GE103K
10,000	20%	Y5U	.315	.118	.197	.020	8.0	3.0	5.0	.5	GE103M
10,000	-20+80	Y5V	.236	.118	.197	.020	6.0	3.0	5.0	.5	GE103Z
22,000	20%	Y5U	.472	.118	.197	.020	12.0	3.0	5.0	.5	GE223M

100 WVDC

Capacity pF	Tol	Temp Coef	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
100	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH101K
120	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH121K
150	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH151K
180	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH181K
220	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH221K
270	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH271K
330	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH331K
390	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH391K
470	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH471K
560	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH561K
680	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH681K
820	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH821K
1,000	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH102K
1,200	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH122K
1,500	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH152K
1,500	20%	Y5U	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH152M
1,500	-20+80	Y5U	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH152Z
1,800	10%	Y5P	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH182K
2,200	10%	Y5P	.315	.118	.252	.025	8.0	3.0	6.4	.6	GH222K
2,200	20%	Y5U	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH222M
2,200	-20+80	Y5U	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH222Z
2,700	10%	Y5P	.315	.118	.252	.025	8.0	3.0	6.4	.6	GH272K
3,300	10%	Y5P	.315	.118	.252	.025	8.0	3.0	6.4	.6	GH332K
3,300	20%	Y5U	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH332M
3,300	-20+80	Y5U	.236	.118	.252	.025	6.0	3.0	6.4	.6	GH332Z
3,900	10%	Y5P	.315	.118	.252	.025	8.0	3.0	6.4	.6	GH392K
4,700	10%	Y5P	.374	.118	.252	.025	9.5	3.0	6.4	.6	GH472K
4,700	20%	Y5U	.315	.118	.252	.025	8.0	3.0	6.4	.6	GH472M
4,700	-20+80	Y5U	.315	.118	.252	.025	8.0	3.0	6.4	.6	GH472Z
5,600	10%	Y5P	.374	.118	.252	.025	9.5	3.0	6.4	.6	GH562K
6,800	10%	Y5P	.472	.118	.252	.025	12.0	3.0	6.4	.6	GH682K
6,800	20%	Y5U	.315	.118	.252	.025	8.0	3.0	6.4	.6	GH682M
6,800	-20+80	Y5U	.315	.118	.252	.025	8.0	3.0	6.4	.6	GH682Z
10,000	10%	Y5P	.472	.118	.252	.025	12.0	3.0	6.4	.6	GH103K
10,000	20%	Y5U	.374	.118	.252	.025	9.5	3.0	6.4	.6	GH103M
10,000	-20+80	Y5U	.374	.118	.252	.025	9.5	3.0	6.4	.6	GH103Z
22,000	-20+80	Y5V	.472	.118	.252	.025	12.0	3.0	6.4	.6	GH223Z
▶ 100,000	-20+80	X7R	.260	.100	.374	.025	6.6	2.5	9.5	.6	GH104ZX*
100,000	-20+80	X7R	.311	.157	.374	.025	7.9	4.0	9.5	.6	GH104ZX3*

* Multilayer construction and rectangular in shape.
The diameter dimension is the largest dimension of the footprint.

▶ Temperature characteristics and case sizes are superior to previous parts.

General Purpose
Disc Ceramic Capacitors

MALLORY

Capacity pF	Tol	Temp Coef	Size (Inches) D T S d	Size (Millimeters) D T S d	Catalog Number
500 WVDC					
1	.25pF	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM010C
3	.25pF	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM030C
3.3	.25pF	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM3R3C
5	.25pF	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM050C
6	.5pF	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM060D
6.8	.5pF	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM6R8D
7	.5pF	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM070D
7.5	.5pF	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM7R5D
8	.5pF	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM080D
10	.5pF	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM100D
12	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM120K
15	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM150K
18	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM180K
20	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM200K
22	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM220K
24	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM240K
27	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM270K
33	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM330K
39	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM390K
47	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM470K
51	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM510K
56	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM560K
68	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM680K
75	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM750K
82	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM820K
91	10%	SL	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM910K
100	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM101K
120	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM121K
150	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM151K
180	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM181K
220	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM221K
270	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM271K
330	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM331K
390	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM391K
470	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM471K
560	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM561K
680	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM681K
820	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM821K
1,000	10%	Y5P	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM102K
1,000	20%	Y5U	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM102M
1,000	-20+80	Y5U	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM102Z
1,500	10%	Y5P	.291 .157 .252 .025	7.4 4.0 6.4 .6	GM152K
1,500	20%	Y5U	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM152M
1,500	-20+80	Y5U	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM152Z
1,800	10%	Y5P	.339 .157 .252 .025	8.6 4.0 6.4 .6	GM182K
2,200	10%	Y5P	.339 .157 .250 .025	8.6 4.0 6.4 .6	GM222K
2,200	20%	Y5U	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM222M
2,200	-20+80	Y5U	.236 .157 .252 .025	6.0 4.0 6.4 .6	GM222Z
2,700	10%	Y5P	.374 .157 .252 .025	9.5 4.0 6.4 .6	GM272K
3,300	10%	Y5P	.433 .157 .252 .025	11.0 4.0 6.4 .6	GM332K
3,300	20%	Y5U	.291 .157 .252 .025	7.4 4.0 6.4 .6	GM332M
3,300	-20+80	Y5U	.291 .157 .252 .025	7.4 4.0 6.4 .6	GM332Z
3,900	10%	Y5P	.433 .157 .252 .025	11.0 4.0 6.4 .6	GM392K
4,700	10%	Y5P	.492 .157 .252 .025	12.5 4.0 6.4 .6	GM472K
4,700	20%	Y5U	.339 .157 .252 .025	8.6 4.0 6.4 .6	GM472M
4,700	-20+80	Y5U	.339 .157 .252 .025	8.6 4.0 6.4 .6	GM472Z
5,600	10%	Y5P	.492 .157 .252 .025	12.5 4.0 6.4 .6	GM562K
6,800	10%	Y5P	.571 .157 .374 .025	14.5 4.0 9.5 .6	GM682K
6,800	20%	Y5U	.433 .157 .252 .025	11.0 4.0 6.4 .6	GM682M
6,800	-20+80	Y5U	.433 .157 .252 .025	11.0 4.0 6.4 .6	GM682Z
8,200	10%	Y5P	.571 .157 .374 .025	14.5 4.0 9.5 .6	GM822K
10,000	10%	Y5P	.642 .157 .374 .025	16.3 4.0 9.5 .6	GM103K
10,000	20%	Y5U	.492 .157 .252 .025	12.5 4.0 6.4 .6	GM103M
10,000	-20+80	Y5U	.492 .157 .252 .025	12.5 4.0 6.4 .6	GM103Z
22,000	20%	Y5U	.642 .157 .374 .025	16.3 4.0 9.5 .6	GM223M
22,000	-20+80	Y5U	.642 .157 .374 .025	16.3 4.0 9.5 .6	GM223Z
▶ 30,000	20%	X7R	.260 .150 .374 .025	6.6 2.5 9.5 .6	GM303MX*
30,000	20%	X7R	.311 .157 .374 .025	7.9 4.0 9.5 .6	GM303MX3*
▶ 50,000	20%	X7R	.260 .100 .374 .025	6.6 2.5 9.5 .6	GM503MX*
50,000	20%	X7R	.311 .157 .374 .025	7.9 4.0 9.5 .6	GM503MX3*
▶ 100,000	20%	X7R	.260 .100 .374 .025	6.6 2.5 9.5 .6	GM104MX*
100,000	20%	X7R	.311 .157 .201 .025	7.9 4.0 5.1 .6	GM104MX2*

Capacity pF	Tol	Temp Coef	Size (Inches) D T S d	Size (Millimeters) D T S d	Catalog Number
1000 WVDC					
3.3	.25PF	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP533
5	.25PF	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP550
6.8	.5PF	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP568
8	.5PF	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP580
10	.5PF	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP410
12	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP412
15	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP415
18	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP418
20	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP420
22	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP422
27	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP427
30	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP430
33	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP433
39	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP439
47	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP447
56	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP456
68	10%	SL	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP468
91	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP491
100	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP310
120	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP312
150	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP315
180	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP318
220	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP322
270	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP327
330	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP333
390	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP339
470	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP347
560	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP356
680	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP368
750	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP375
820	10%	Y5P	.236 .177 .252 .025	6.0 4.5 6.4 .6	GP382
1,000	10%	Y5P	.291 .177 .252 .025	7.4 4.5 6.4 .6	GP210
1,500	10%	Y5P	.339 .177 .252 .025	8.6 4.5 6.4 .6	GP215
1,800	10%	Y5P	.374 .177 .252 .025	9.5 4.5 6.4 .6	GP218
2,200	10%	Y5P	.374 .177 .252 .025	9.5 4.5 6.4 .6	GP222
2,700	10%	Y5P	.433 .177 .252 .025	11.0 4.5 6.4 .6	GP227
3,300	10%	Y5P	.433 .177 .252 .025	11.0 4.5 6.4 .6	GP233P
3,900	10%	Y5P	.492 .177 .252 .025	12.5 4.5 6.4 .6	GP239
4,700	20%	Y5U	.433 .177 .252 .025	11.0 4.5 6.4 .6	GP247
5,600	10%	Y5P	.591 .177 .374 .025	15.0 4.5 9.5 .6	GP256
6,800	10%	Y5P	.669 .177 .374 .025	17.0 4.5 9.5 .6	GP268P
10,000	20%	Y5U	.591 .177 .374 .025	15.0 4.5 9.5 .6	GP110
22,000	20%	Y5U	.748 .177 .374 .025	19.0 4.5 9.5 .6	GP122

* Multilayer construction and rectangular in shape.
The diameter dimension is the largest dimension of the footprint.

▶ Temperature characteristics and case sizes are superior to previous parts.

General Purpose
Disc Ceramic Capacitors

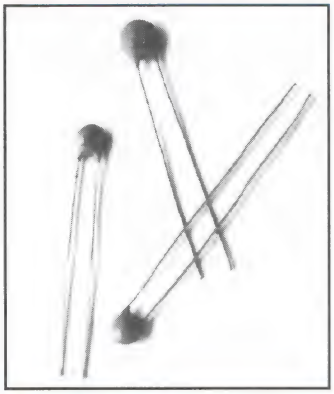
MALLORY

Capacity pF	Tol	Temp Coef	Size (Inches) D T S d	Size (Millimeters) D T S d	Catalog Number
2000 WVDC					
1	.25pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR510
1.5	.25pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR515
2	.25pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR520
3	.25pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR530
4	.25pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR540
5	.25pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR550
6	.5pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR560
7	.5pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR570
8	.5pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR580
9	.5pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR590
10	.5pf	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR410
11	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR411
12	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR412
13	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR413
15	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR415
16	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR416
18	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR418
20	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR420
22	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR422
24	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR424
27	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR427
30	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR430
33	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR433
36	5%	SL	.315 .197 .252 .032	8.0 5.0 6.4 .8	GR436
39	5%	SL	.394 .197 .252 .032	10.0 5.0 6.4 .8	GR439
43	5%	SL	.394 .197 .252 .032	10.0 5.0 6.4 .8	GR443
47	5%	SL	.394 .197 .252 .032	10.0 5.0 6.4 .8	GR470
51	5%	SL	.394 .197 .252 .032	10.0 5.0 6.4 .8	GR451
56	5%	SL	.394 .197 .252 .032	10.0 5.0 6.4 .8	GR456
62	5%	SL	.394 .197 .252 .032	10.0 5.0 6.4 .8	GR462
68	5%	SL	.394 .197 .252 .032	10.0 5.0 6.4 .8	GR468
75	5%	SL	.394 .197 .252 .032	10.0 5.0 6.4 .8	GR475
82	5%	SL	.472 .197 .252 .032	12.0 5.0 6.4 .8	GR482
91	5%	SL	.472 .197 .252 .032	12.0 5.0 6.4 .8	GR491
100	5%	SL	.472 .197 .252 .032	12.0 5.0 6.4 .8	GR310
100	10%	Y5P	.315 .197 .252 .032	8.0 5.0 6.4 .8	GS310
110	5%	SL	.472 .197 .252 .032	12.0 5.0 6.4 .8	GR311
120	5%	SL	.591 .197 .374 .032	15.0 5.0 9.5 .8	GR312
120	10%	Y5P	.315 .197 .252 .032	8.0 5.0 6.4 .8	GS312
130	5%	SL	.591 .197 .374 .032	15.0 5.0 9.5 .8	GR313
150	5%	SL	.591 .197 .374 .032	15.0 5.0 9.5 .8	GR315
150	10%	Y5P	.315 .197 .252 .032	8.0 5.0 6.4 .8	GS315
160	5%	SL	.591 .197 .374 .032	15.0 5.0 9.5 .8	GR316
180	5%	SL	.591 .197 .374 .032	15.0 5.0 9.5 .8	GR318
180	10%	Y5P	.315 .197 .252 .032	8.0 5.0 6.4 .8	GS318
200	5%	SL	.591 .197 .374 .032	15.0 5.0 9.5 .8	GR320
220	5%	SL	.591 .197 .374 .032	15.0 5.0 9.5 .8	GR322
220	10%	Y5P	.315 .197 .252 .032	8.0 5.0 6.4 .8	GS322
240	5%	SL	.787 .197 .374 .032	20.0 5.0 9.5 .8	GR324
270	5%	SL	.787 .197 .374 .032	20.0 5.0 9.5 .8	GR327
270	10%	Y5P	.315 .197 .252 .032	8.0 5.0 6.4 .8	GS327
300	5%	SL	.787 .197 .374 .032	20.0 5.0 9.5 .8	GR330
330	5%	SL	.787 .197 .374 .032	20.0 5.0 9.5 .8	GR333
330	10%	Y5P	.315 .197 .252 .032	8.0 5.0 6.4 .8	GS333
360	5%	SL	.787 .197 .374 .032	20.0 5.0 9.5 .8	GR336
390	5%	SL	.787 .197 .374 .032	20.0 5.0 9.5 .8	GR339
390	10%	Y5P	.315 .197 .252 .032	8.0 5.0 6.4 .8	GS339
430	5%	SL	.787 .197 .374 .032	20.0 5.0 9.5 .8	GR343
470	10%	Y5P	.394 .197 .252 .032	10.0 5.0 6.4 .8	GS347
560	10%	Y5P	.394 .197 .252 .032	10.0 5.0 6.4 .8	GS356
680	10%	Y5P	.394 .197 .252 .032	10.0 5.0 6.4 .8	GS368
820	10%	Y5P	.394 .197 .252 .032	10.0 5.0 6.4 .8	GS382
1,000	10%	Y5P	.472 .197 .252 .032	12.0 5.0 6.4 .8	GS210
1,200	10%	Y5P	.472 .197 .252 .032	12.0 5.0 6.4 .8	GS212
1,500	10%	Y5P	.591 .197 .374 .032	15.0 5.0 9.5 .8	GS215
1,800	10%	Y5P	.591 .197 .374 .032	15.0 5.0 9.5 .8	GS218
2,200	10%	Y5P	.591 .197 .374 .032	15.0 5.0 9.5 .8	GS222
2,700	10%	Y5P	.591 .197 .374 .032	15.0 5.0 9.5 .8	GS272
3,300	10%	Y5P	.787 .197 .374 .032	20.0 5.0 9.5 .8	GS233
3,900	10%	Y5P	.787 .197 .374 .032	20.0 5.0 9.5 .8	GS239
4,700	10%	Y5P	.787 .197 .374 .032	20.0 5.0 9.5 .8	GS247

Capacity pF	Tol	Temp Coef	Size (Inches) D T S d	Size (Millimeters) D T S d	Catalog Number
3000 WVDC					
1	.25pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT510
1.5	.25pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT515
2	.25pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT520
3	.25pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT530
4	.25pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT540
5	.25pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT550
6	.5pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT560
7	.5pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT570
8	.5pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT580
9	.5pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT590
10	.5pF	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT410
11	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT411
12	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT412
13	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT413
14	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT415
16	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT416
18	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT418
20	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT420
22	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT422
24	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT424
27	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT427
30	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT430
36	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT436
39	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT439
44	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT443
47	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT447
51	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT451
56	5%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	GT456
62	5%	SL	.472 .236 .374 .032	12.0 6.0 9.5 .8	GT462
68	5%	SL	.472 .236 .374 .032	12.0 6.0 9.5 .8	GT468
75	5%	SL	.472 .236 .374 .032	12.0 6.0 9.5 .8	GT475
82	5%	SL	.472 .236 .374 .032	12.0 6.0 9.5 .8	GT482
91	5%	SL	.591 .236 .374 .032	15.0 6.0 9.5 .8	GT491
100	5%	SL	.591 .236 .374 .032	15.0 6.0 9.5 .8	GT310
110	5%	SL	.591 .236 .374 .032	15.0 6.0 9.5 .8	GT311
160	5%	SL	.591 .236 .374 .032	15.0 6.0 9.5 .8	GT316
180	5%	SL	.787 .236 .374 .032	20.0 6.0 9.5 .8	GT318
200	5%	SL	.787 .236 .374 .032	20.0 6.0 9.5 .8	GT320
220	5%	SL	.787 .236 .374 .032	20.0 6.0 9.5 .8	GT321
240	5%	SL	.787 .236 .374 .032	20.0 6.0 9.5 .8	GT324
270	5%	SL	.787 .236 .374 .032	20.0 6.0 9.5 .8	GT327
300	5%	SL	.787 .236 .374 .032	20.0 6.0 9.5 .8	GT330

EIA Class 1 Temperature Compensating Disc Ceramic Capacitors

MALLORY



- Temperature Compensating
- Ideal For Use in Timing and Oscillating Circuits
- Conformally Coated
- Radial Leads

GENERAL SPECIFICATIONS

Temperature Range:
-55°C to +125°C

Voltage Range:
50, 500,
1,000, 2,000, 3,000 WVDC

Capacitance Range:
1 pF to 470 pF

Lead Length: 1 inch minimum

Insulation Resistance:
10,000 megohms (min.)

Power Factor @ 1 MHz:
5% Max

Breakdown Voltage:
3 x rated
(5 seconds Max)

Capacity pF	Tol	Temp Coef	Size (Inches) D T S d	Size (Millimeters) D T S d	Catalog Number
50 WVDC					
1	.25PF	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC010C
1.5	.25PF	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC1R5C
2	.25PF	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC020C
2	.25PF	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES020C
3	.25PF	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC030C
3	.25PF	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES030C
4	.25PF	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC040C
4	.25PF	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES040C
5	.25PF	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC050C
5	.25PF	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES050C
6	.5PF	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC060D
6	.5PF	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES060D
7	.5PF	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC070D
7	.5PF	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES070D
8	.5PF	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC080D
8	.5PF	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES080D
9	.5PF	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC090D
9	.5PF	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES090D
10	5%	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC100J
10	.5PF	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES100D
10	.5PF	N750	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEU100D
11	5%	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC110J
11	5%	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES110J
12	5%	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC120J
12	5%	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES120J
13	5%	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC130J
13	5%	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES130J
15	5%	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC150J
15	5%	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES150J
16	5%	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC160J
16	5%	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES160J
18	5%	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC180J
18	5%	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES180J
20	5%	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC200J
20	5%	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES200J
22	5%	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC220J
22	5%	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES220J
22	5%	N750	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEU220J
24	5%	NPO	.157 .118 .098 .015	4.0 3.0 2.5 .4	CEC240J
24	5%	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES240J
27	5%	NPO	.197 .118 .098 .015	5.0 3.0 2.5 .4	CEC270J
27	5%	N330	.157 .118 .098 .015	4.0 3.0 2.5 .4	CES270J
30	5%	NPO	.197 .118 .098 .015	5.0 3.0 2.5 .4	CEC300J
30	5%	N330	.197 .118 .098 .015	5.0 3.0 2.5 .4	CES300J
33	5%	NPO	.197 .118 .098 .015	5.0 3.0 2.5 .4	CEC330J
33	5%	N330	.197 .118 .098 .015	5.0 3.0 2.5 .4	CES330J
36	5%	NPO	.197 .118 .197 .020	5.0 3.0 5.0 .5	CEC360J
36	5%	N330	.197 .118 .098 .015	5.0 3.0 2.5 .4	CES360J
39	5%	NPO	.197 .118 .197 .020	5.0 3.0 5.0 .5	CEC390J
39	5%	N330	.197 .118 .098 .015	5.0 3.0 2.5 .4	CES390J
43	5%	NPO	.236 .118 .197 .020	6.0 3.0 5.0 .5	CEC430J
43	5%	N330	.197 .118 .197 .020	5.0 3.0 5.0 .5	CES430J
47	5%	NPO	.236 .118 .197 .020	6.0 3.0 5.0 .5	CEC470J
47	5%	N330	.197 .118 .197 .020	5.0 3.0 5.0 .5	CES470J

Capacity pF	Tol	Temp Coef	Size (Inches) D T S d	Size (Millimeters) D T S d	Catalog Number
50 WVDC					
51	5%	NPO	.236 .118 .197 .020	6.0 3.0 5.0 .5	CEC510J
51	5%	N330	.236 .118 .197 .020	6.0 3.0 5.0 .5	CES510J
51	5%	N750	.197 .118 .098 .015	5.0 3.0 2.5 .4	CEU510J
56	5%	NPO	.236 .118 .197 .020	6.0 3.0 5.0 .5	CEC560J
56	5%	N330	.236 .118 .197 .020	6.0 3.0 5.0 .5	CES560J
62	5%	NPO	.276 .118 .197 .020	7.0 3.0 5.0 .5	CEC620J
62	5%	N330	.236 .118 .197 .020	6.0 3.0 5.0 .5	CES620J
68	5%	NPO	.276 .118 .197 .020	7.0 3.0 5.0 .5	CEC680J
68	5%	N330	.236 .118 .197 .020	6.0 3.0 5.0 .5	CES680J
68	5%	N750	.197 .118 .197 .020	5.0 3.0 5.0 .5	CEU680J
75	5%	NPO	.276 .118 .197 .020	7.0 3.0 5.0 .5	CEC750J
75	5%	N330	.276 .118 .197 .020	7.0 3.0 5.0 .5	CES750J
82	5%	NPO	.276 .118 .197 .020	7.0 3.0 5.0 .5	CEC820J
82	5%	N330	.276 .118 .197 .020	7.0 3.0 5.0 .5	CES820J
91	5%	NPO	.315 .118 .197 .020	8.0 3.0 5.0 .5	CEC910J
91	5%	N330	.276 .118 .197 .020	7.0 3.0 5.0 .5	CES910J
100	5%	NPO	.315 .118 .197 .020	8.0 3.0 5.0 .5	CEC101J
100	5%	N330	.276 .118 .197 .020	7.0 3.0 5.0 .5	CES101J
100	5%	N750	.236 .118 .197 .020	6.0 3.0 5.0 .5	CEU101J
110	5%	NPO	.315 .118 .197 .020	8.0 3.0 5.0 .5	CEC111J
110	5%	N330	.315 .118 .197 .020	8.0 3.0 5.0 .5	CES111J
120	5%	NPO	.315 .118 .197 .020	8.0 3.0 5.0 .5	CEC121J
120	5%	N330	.315 .118 .197 .020	8.0 3.0 5.0 .5	CES121J
120	5%	N750	.236 .118 .197 .020	6.0 3.0 5.0 .5	CEU121J
130	5%	NPO	.354 .118 .197 .020	9.0 3.0 5.0 .5	CEC131J
130	5%	N330	.315 .118 .197 .020	8.0 3.0 5.0 .5	CES131J
150	5%	NPO	.354 .118 .197 .020	9.0 3.0 5.0 .5	CEC151J
150	5%	N330	.315 .118 .197 .020	8.0 3.0 5.0 .5	CES151J
160	5%	NPO	.354 .118 .197 .020	9.0 3.0 5.0 .5	CEC161J
160	5%	N330	.354 .118 .197 .020	9.0 3.0 5.0 .5	CES161J
180	5%	NPO	.374 .118 .197 .020	9.5 3.0 5.0 .5	CEC181J
180	5%	N330	.354 .118 .197 .020	9.0 3.0 5.0 .5	CES181J
200	5%	NPO	.414 .118 .197 .020	10.5 3.0 5.0 .5	CEC201J
200	5%	N330	.374 .118 .197 .020	9.5 3.0 5.0 .5	CES201J
220	5%	NPO	.413 .118 .197 .020	10.5 3.0 5.0 .5	CEC221J
220	5%	N330	.374 .118 .197 .020	9.5 3.0 5.0 .5	CES221J
220	5%	N750	.315 .118 .197 .020	8.0 3.0 5.0 .5	CEU221J
240	5%	NPO	.472 .118 .197 .020	12.0 3.0 5.0 .5	CEC241J
240	5%	N330	.413 .118 .197 .020	10.5 3.0 5.0 .5	CES241J
270	5%	NPO	.472 .118 .197 .020	12.0 3.0 5.0 .5	CEC271J
270	5%	N330	.413 .118 .197 .020	10.5 3.0 5.0 .5	CES271J
270	5%	N750	.374 .118 .197 .020	9.5 3.0 5.0 .5	CEU271J
300	5%	NPO	.472 .118 .197 .020	12.0 3.0 5.0 .5	CEC301J
300	5%	N330	.472 .118 .197 .020	12.0 3.0 5.0 .5	CES301J
300	5%	N750	.354 .118 .197 .020	9.0 3.0 5.0 .5	CEU301J
330	5%	N330	.472 .118 .197 .020	12.0 3.0 5.0 .5	CES331J
330	5%	N750	.354 .118 .197 .020	9.0 3.0 5.0 .5	CEU331J
360	5%	N330	.472 .118 .197 .020	12.0 3.0 5.0 .5	CES361J
390	5%	N330	.472 .118 .197 .020	12.0 3.0 5.0 .5	CES391J
390	5%	N750	.413 .118 .197 .020	10.5 3.0 5.0 .5	CEU391J
470	5%	N750	.413 .118 .197 .020	10.5 3.0 5.0 .5	CEU471J

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

EIA Class 1 Temperature Compensating **Disc Ceramic Capacitors**

MALLORY

Capacity pF	Tol	Temp Coef	Size (Inches) D T S d	Size (Millimeters) D T S d	Catalog Number
500 WVDC					
1	.25pF	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC010C
1.5	.25pF	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC1R5C
1.5	.25pF	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU1R5C
2	.25pF	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC020C
3	.25pF	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC030C
3.3	.25pF	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU3R3C
4	.25pF	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC040C
4.7	.25pF	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU4R7C
5	.25pF	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC050C
5	.25pF	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU050C
6	.5pF	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC060D
6.8	.5pF	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU6R8D
7	.5pF	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC070D
8	.5pF	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC080D
8.2	.5pF	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU8R2D
9	.5pF	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC090D
10	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC100J
10	.5pF	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU100D
10	.5pF	N1500	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMW100D
11	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC110J
12	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC120J
12	5%	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU120J
13	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC130J
15	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC150J
15	5%	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU150J
16	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC160J
18	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC180J
18	5%	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU180J
20	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC200J
20	5%	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU200J
22	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC220J
22	5%	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU220J
22	5%	N1500	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMW220J
24	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC240J
27	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC270J
30	5%	NPO	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMC300J
33	5%	NPO	.291 .157 .252 .025	7.4 4.0 6.4 .6	CMC330J
33	5%	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU330J
36	5%	NPO	.291 .157 .252 .025	7.4 4.0 6.4 .6	CMC360J
39	5%	NPO	.291 .157 .252 .025	7.4 4.0 6.4 .6	CMC390J
39	5%	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU390J
43	5%	NPO	.291 .157 .252 .025	7.4 4.0 6.4 .6	CMC430J
47	5%	NPO	.291 .157 .252 .025	7.4 4.0 6.4 .6	CMC470J
47	5%	N1500	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMW470J
51	5%	NPO	.374 .157 .252 .025	9.5 4.0 6.4 .6	CMC510J
51	5%	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU510J
51	5%	N1500	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMW510J
56	5%	NPO	.374 .157 .252 .025	9.5 4.0 6.4 .6	CMC560J
56	5%	N750	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMU560J
56	5%	N1500	.236 .157 .252 .025	6.0 4.0 6.4 .6	CMW560J
62	5%	NPO	.374 .157 .252 .025	9.5 4.0 6.4 .6	CMC620J
68	5%	NPO	.374 .157 .252 .025	9.5 4.0 6.4 .6	CMC680J
68	5%	N750	.291 .157 .252 .025	7.4 4.0 6.4 .6	CMU680J
75	5%	NPO	.374 .157 .252 .025	9.5 4.0 6.4 .6	CMC750J
82	5%	NPO	.374 .157 .252 .025	9.5 4.0 6.4 .6	CMC820J
91	5%	NPO	.433 .157 .252 .025	11.0 4.0 6.4 .6	CMC910J
100	5%	NPO	.433 .157 .252 .025	11.0 4.0 6.4 .6	CMC101J
100	5%	N750	.291 .157 .252 .025	7.4 4.0 6.4 .6	CMU101J
100	5%	N1500	.291 .157 .252 .025	7.4 4.0 6.4 .6	CMW101J
110	5%	NPO	.433 .157 .252 .025	11.0 4.0 6.4 .6	CMC111J
120	5%	NPO	.433 .157 .252 .025	11.0 4.0 6.4 .6	CMC121J
130	5%	NPO	.492 .157 .252 .025	12.5 4.0 6.4 .6	CMC131J
150	5%	NPO	.492 .157 .252 .025	12.5 4.0 6.4 .6	CMC151J
160	5%	NPO	.492 .157 .252 .025	12.5 4.0 6.4 .6	CMC161J
180	5%	NPO	.571 .157 .374 .025	14.5 4.0 9.5 .6	CMC181J
200	5%	NPO	.571 .157 .374 .025	14.5 4.0 9.5 .6	CMC201J
220	5%	NPO	.571 .157 .374 .025	14.5 4.0 9.5 .6	CMC221J
240	5%	NPO	.571 .157 .374 .025	14.5 4.0 9.5 .6	CMC241J
270	5%	NPO	.642 .157 .374 .025	16.3 4.0 9.5 .6	CMC271J
300	5%	NPO	.642 .157 .374 .025	16.3 4.0 9.5 .6	CMC301J
330	5%	NPO	.642 .157 .374 .025	16.3 4.0 9.5 .6	CMC331J
360	5%	NPO	.748 .157 .374 .025	19.0 4.0 9.5 .6	CMC361J
390	5%	NPO	.748 .157 .374 .025	19.0 4.0 9.5 .6	CMC391J
390	5%	N1500	.492 .157 .252 .025	12.5 4.0 6.4 .6	CMW391J
430	5%	NPO	.748 .157 .374 .025	19.0 4.0 9.5 .6	CMC431J
1000 WVDC					
1	.25pF	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC010C
1.5	.25pF	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC1R5C
2.2	.25pF	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC2R2C
3.3	.25pF	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC3R3C
4.7	.25pF	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC4R7C
6.8	.5pF	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC6R8D
8.2	.5pF	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC8R2D
9.6	.5pF	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC9R6D
10	.5pF	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC100D
11	5%	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC110J
12	5%	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC120J
13	5%	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC130J
15	5%	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC150J
16	5%	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC160J
18	5%	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC180J
20	5%	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC200J
22	5%	NPO	.236 .177 .252 .025	6.0 4.5 6.4 .6	CPC220J
24	5%	NPO	.291 .177 .252 .025	7.4 4.5 6.4 .6	CPC240J
27	5%	NPO	.291 .177 .252 .025	7.4 4.5 6.4 .6	CPC270J
30	5%	NPO	.291 .177 .252 .025	7.4 4.5 6.4 .6	CPC300J
33	5%	NPO	.291 .177 .252 .025	7.4 4.5 6.4 .6	CPC330J
36	5%	NPO	.374 .177 .252 .025	9.5 4.5 6.4 .6	CPC360J
39	5%	NPO	.374 .177 .252 .025	9.5 4.5 6.4 .6	CPC390J
43	5%	NPO	.374 .177 .252 .025	9.5 4.5 6.4 .6	CPC430J
47	5%	NPO	.374 .177 .252 .025	9.5 4.5 6.4 .6	CPC470J
51	5%	NPO	.374 .177 .252 .025	9.5 4.5 6.4 .6	CPC510J
56	5%	NPO	.374 .177 .252 .025	9.5 4.5 6.4 .6	CPC560J
62	5%	NPO	.374 .177 .252 .025	9.5 4.5 6.4 .6	CPC620J
68	5%	NPO	.433 .177 .252 .025	11.0 4.5 6.4 .6	CPC680J
75	5%	NPO	.433 .177 .252 .025	11.0 4.5 6.4 .6	CPC750J
82	5%	NPO	.433 .177 .252 .025	11.0 4.5 6.4 .6	CPC820J
91	5%	NPO	.433 .177 .252 .025	11.0 4.5 6.4 .6	CPC910J
100	5%	NPO	.512 .177 .252 .025	13.0 4.5 6.4 .6	CPC101J
110	5%	NPO	.512 .177 .252 .025	13.0 4.5 6.4 .6	CPC111J
120	5%	NPO	.512 .177 .252 .025	13.0 4.5 6.4 .6	CPC121J
130	5%	NPO	.512 .177 .252 .025	13.0 4.5 6.4 .6	CPC131J
150	5%	NPO	.591 .177 .374 .025	15.0 4.5 9.5 .6	CPC151J
160	5%	NPO	.591 .177 .374 .025	15.0 4.5 9.5 .6	CPC161J
180	5%	NPO	.591 .177 .374 .025	15.0 4.5 9.5 .6	CPC181J
200	5%	NPO	.669 .177 .374 .025	17.0 4.5 9.5 .6	CPC201J
220	5%	NPO	.669 .177 .374 .025	17.0 4.5 9.5 .6	CPC221J
270	5%	NPO	.748 .177 .374 .025	19.0 4.5 9.5 .6	CPC271J
300	5%	NPO	.748 .177 .374 .025	19.0 4.5 9.5 .6	CPC301J
330	5%	NPO	.748 .177 .374 .025	19.0 4.5 9.5 .6	CPC331J

EIA Class 1 Temperature Compensating
Disc Ceramic Capacitors

MALLORY

Capacity pF	Tol	Temp Coef	Size (Inches) D T S d	Size (Millimeters) D T S d	Catalog Number
2000 WVDC					
1	.25pF	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC010C
1.5	.25pF	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC1R5C
2	.25pF	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC020C
3	.25pF	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC030C
4	.25pF	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC040C
5	.25pF	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC050C
6	.5pF	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC060D
7	.5pF	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC070D
9	.5pF	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC090D
10	.5pF	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC100D
11	5%	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC110J
12	5%	NPO	.315 .197 .252 .032	8.0 5.0 6.4 .8	CRC120J
13	5%	NPO	.394 .197 .252 .032	10.0 5.0 6.4 .8	CRC130J
15	5%	NPO	.394 .197 .252 .032	10.0 5.0 6.4 .8	CRC150J
16	5%	NPO	.394 .197 .252 .032	10.0 5.0 6.4 .8	CRC160J
20	5%	NPO	.394 .197 .252 .032	10.0 5.0 6.4 .8	CRC200J
22	5%	NPO	.394 .197 .252 .032	10.0 5.0 6.4 .8	CRC220J
24	5%	NPO	.394 .197 .252 .032	10.0 5.0 6.4 .8	CRC240J
27	5%	NPO	.472 .197 .252 .032	12.0 5.0 6.4 .8	CRC270J
30	5%	NPO	.472 .197 .252 .032	12.0 5.0 6.4 .8	CRC300J
33	5%	NPO	.472 .197 .252 .032	12.0 5.0 6.4 .8	CRC330J
36	5%	NPO	.472 .197 .252 .032	12.0 5.0 6.4 .8	CRC360J
39	5%	NPO	.591 .197 .374 .032	15.0 5.0 9.5 .8	CRC390J
43	5%	NPO	.591 .197 .374 .032	15.0 5.0 9.5 .8	CRC430J
47	5%	NPO	.591 .197 .374 .032	15.0 5.0 9.5 .8	CRC470J
51	5%	NPO	.591 .197 .374 .032	15.0 5.0 9.5 .8	CRC510J
56	5%	NPO	.591 .197 .374 .032	15.0 5.0 9.5 .8	CRC560J
62	5%	NPO	.591 .197 .374 .032	15.0 5.0 9.5 .8	CRC620J
68	5%	NPO	.591 .197 .374 .032	15.0 5.0 9.5 .8	CRC680J
75	5%	NPO	.787 .197 .374 .032	20.0 5.0 9.5 .8	CRC750J
82	5%	NPO	.787 .197 .374 .032	20.0 5.0 9.5 .8	CRC820J
91	5%	NPO	.787 .197 .374 .032	20.0 5.0 9.5 .8	CRC910J
100	5%	NPO	.787 .197 .374 .032	20.0 5.0 9.5 .8	CRC101J
110	5%	NPO	.787 .197 .374 .032	20.0 5.0 9.5 .8	CRC111J
120	5%	NPO	.787 .197 .374 .032	20.0 5.0 9.5 .8	CRC121J
130	5%	NPO	.787 .197 .374 .032	20.0 5.0 9.5 .8	CRC131J

Capacity pF	Tol	Temp Coef	Size (Inches) D T S d	Size (Millimeters) D T S d	Catalog Number
3000 WVDC					
1	.25pF	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ010C
1.5	.25pF	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ1R5C
2	.25pF	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ020C
3	.25pF	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ030C
4	.25pF	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ040C
5	.25pF	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ050C
6	.5pF	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ060D
7	.5pF	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ070D
9	.5pF	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ090D
10	.5pF	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ100D
11	5%	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ110J
12	5%	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ120J
13	5%	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ130J
15	5%	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ150J
16	5%	NPO	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ160J
18	5%	NPO	.472 .236 .374 .032	12.0 6.0 9.5 .8	CTZ180J
20	5%	NPO	.472 .236 .374 .032	12.0 6.0 9.5 .8	CTZ200J
22	5%	NPO	.472 .236 .374 .032	12.0 6.0 9.5 .8	CTZ220J
22	10%	SL	.394 .236 .374 .032	10.0 6.0 9.5 .8	CTZ220K
24	5%	NPO	.472 .236 .374 .032	12.0 6.0 9.5 .8	CTZ240J
27	5%	NPO	.591 .236 .374 .032	15.0 6.0 9.5 .8	CTZ270J
30	5%	NPO	.591 .236 .374 .032	15.0 6.0 9.5 .8	CTZ300J
33	5%	NPO	.591 .236 .374 .032	15.0 6.0 9.5 .8	CTZ330J
36	5%	NPO	.591 .236 .374 .032	15.0 6.0 9.5 .8	CTZ360J
39	5%	NPO	.591 .236 .374 .032	15.0 6.0 9.5 .8	CTZ390J
43	5%	NPO	.591 .236 .374 .032	15.0 6.0 9.5 .8	CTZ430J
47	5%	NPO	.591 .236 .374 .032	15.0 6.0 9.5 .8	CTZ470J
51	5%	NPO	.591 .236 .374 .032	15.0 6.0 9.5 .8	CTZ510J
56	5%	NPO	.787 .236 .374 .032	20.0 6.0 9.5 .8	CTZ560J
62	5%	NPO	.787 .236 .374 .032	20.0 6.0 9.5 .8	CTZ620J
68	5%	NPO	.787 .236 .374 .032	20.0 6.0 9.5 .8	CTZ680J
75	5%	NPO	.787 .236 .374 .032	20.0 6.0 9.5 .8	CTZ750J
82	5%	NPO	.787 .236 .374 .032	20.0 6.0 9.5 .8	CTZ820J
91	5%	NPO	.787 .236 .374 .032	20.0 6.0 9.5 .8	CTZ910J
100	10%	SL	.591 .236 .374 .032	15.0 6.0 9.5 .8	CTZ101K

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

EIA Class 2 Temperature/ Frequency Stable
Disc Ceramic Capacitors

MALLORY

- Provides Exceptional Stability Where Minimum Variation in Capacitance is Required
- Conformally Coated
- Radial Leads

GENERAL SPECIFICATIONS

Temperature Range:
-30°C to +85°C

Voltage Range:
500 and 1,000 VDC

Capacitance Range:
100 pF to 10,000 pF

Lead Length: 1 inch minimum

Insulation Resistance:
10,000 megohms (min)

Power Factor @ 1000 Hz:
1.5% Max

Breakdown Voltage:
2.5 x rated
(5 seconds Max)

500 WVDC

Capacity pF	Tol	Temp Coef	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
150	10%	Y5E	.236	.157	.252	.025	6.0	4.0	6.4	.6	SM151K
220	10%	Y5E	.236	.157	.252	.025	6.0	4.0	6.4	.6	SM221K
390	10%	Y5E	.236	.157	.252	.025	6.0	4.0	6.4	.6	SM391K
470	10%	Y5E	.236	.157	.252	.025	6.0	4.0	6.4	.6	SM471K
560	10%	Y5E	.236	.157	.252	.025	6.0	4.0	6.4	.6	SM561K
680	10%	Y5E	.236	.157	.252	.025	6.0	4.0	6.4	.6	SM681K
1,000	10%	Y5E	.339	.157	.252	.025	8.6	4.0	6.4	.6	SM102K
2,200	10%	Y5E	.433	.157	.252	.025	11.0	4.0	6.4	.6	SM222K
4,700	10%	Y5E	.571	.157	.374	.025	14.5	4.0	9.5	.6	SM472K
6,800	10%	Y5E	.748	.157	.374	.025	19.0	4.0	9.5	.6	SM682K
10,000	10%	Y5E	.748	.157	.374	.025	19.0	4.0	9.5	.6	SM103K

1000 WVDC

Capacity pF	Tol	Temp Coef	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
100	10%	Y5P	.236	.177	.252	.025	6.0	4.5	6.4	.6	SP101K
150	10%	Y5P	.236	.177	.252	.025	6.0	4.5	6.4	.6	SP151K
180	10%	Y5P	.236	.177	.252	.025	6.0	4.5	6.4	.6	SP181K
220	10%	Y5P	.236	.177	.252	.025	6.0	4.5	6.4	.6	SP221K
270	10%	Y5P	.236	.177	.252	.025	6.0	4.5	6.4	.6	SP271K
330	10%	Y5P	.236	.177	.252	.025	6.0	4.5	6.4	.6	SP331K
390	10%	Y5P	.236	.177	.252	.025	6.0	4.5	6.4	.6	SP391K
470	10%	Y5P	.236	.177	.252	.025	6.0	4.5	6.4	.6	SP471K
560	10%	Y5P	.236	.177	.252	.025	6.0	4.5	6.4	.6	SP561K
680	10%	Y5P	.236	.177	.252	.025	6.0	4.5	6.4	.6	SP681K
1,000	10%	Y5P	.291	.177	.252	.025	7.4	4.5	6.4	.6	SP102K
1,500	10%	Y5P	.339	.177	.252	.025	8.6	4.5	6.4	.6	SP152K
1,800	10%	Y5P	.374	.177	.252	.025	9.5	4.5	6.4	.6	SP182K
2,200	10%	Y5P	.374	.177	.252	.025	9.5	4.5	6.4	.6	SP222K
2,700	10%	Y5P	.433	.177	.252	.025	11.0	4.5	6.4	.6	SP272K
3,900	10%	Y5P	.492	.177	.252	.025	12.5	4.5	6.4	.6	SP392K
4,700	10%	Y5P	.591	.177	.374	.025	15.0	4.5	9.5	.6	SP472K

HIGH VOLTAGE

- Highly Efficient for Bypass and Coupling Applications
- Designed Around EIA Test Spec. RS-165A
- Radial Leads

GENERAL SPECIFICATIONS

Temperature Range:
-30°C to +85°C

Voltage Range:
2,000 and 3,000 WVDC

Capacitance Range:
100pF to 10,000 pF

Insulation Resistance:
10,000 megohms (min)

Power Factor @ 1000 Hz:
2.5% Max

Breakdown Voltage:
2.5 x rated
(5 seconds Max)

Lead Length: 1 inch minimum

2000 WVDC

Capacity pF	Tol	Temp Coef	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
1,000	20%	Y5U	.394	.197	.252	.032	10.0	5.0	6.4	.8	HS102M
1,500	20%	Y5U	.394	.197	.252	.032	10.0	5.0	6.4	.8	HS152M
2,200	20%	Y5U	.472	.197	.252	.032	12.0	5.0	6.4	.8	HS222M
3,300	20%	Y5U	.591	.197	.374	.032	15.0	5.0	9.5	.8	HS332M
4,700	20%	Y5U	.591	.197	.374	.032	15.0	5.0	9.5	.8	HS472M
6,800	20%	Y5U	.787	.197	.374	.032	20.0	5.0	9.5	.8	HS682M
10,000	20%	Y5U	.787	.197	.374	.032	20.0	5.0	9.5	.8	HS103M

3000 WVDC

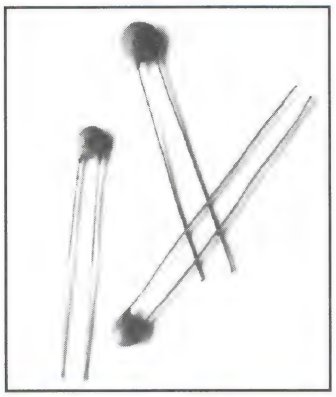
Capacity pF	Tol	Temp Coef	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
100	10%	Y5P	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT101K
120	10%	Y5P	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT121K
150	10%	Y5P	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT151K
180	10%	Y5P	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT181K
220	10%	Y5P	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT221K
270	10%	Y5P	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT271K
330	10%	Y5P	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT331K

3000 WVDC

Capacity pF	Tol	Temp Coef	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
390	10%	Y5P	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT391K
470	10%	Y5P	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT471K
560	10%	Y5P	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT561K
680	10%	Y5P	.472	.236	.374	.032	12.0	6.0	9.5	.8	HT681K
820	10%	Y5P	.472	.236	.374	.032	12.0	6.0	9.5	.8	HT821K
1,000	10%	Y5P	.591	.236	.374	.032	15.0	6.0	9.5	.8	HT102K
1,000	20%	Y5U	.394	.236	.374	.032	10.0	6.0	9.5	.8	HT102M
1,200	10%	Y5P	.591	.236	.374	.032	15.0	6.0	9.5	.8	HT122K
1,500	10%	Y5P	.591	.236	.374	.032	15.0	6.0	9.5	.8	HT152K
1,500	20%	Y5U	.472	.236	.374	.032	12.0	6.0	9.5	.8	HT152M
1,800	10%	Y5P	.591	.236	.374	.032	15.0	6.0	9.5	.8	HT182K
1,800	20%	Y5U	.591	.236	.374	.032	15.0	6.0	9.5	.8	HT182M
2,200	10%	Y5P	.787	.236	.374	.032	20.0	6.0	9.5	.8	HT222K
2,200	20%	Y5U	.591	.236	.374	.032	15.0	6.0	9.5	.8	HT222M
2,700	10%	Y5P	.787	.236	.374	.032	20.0	6.0	9.5	.8	HT272K
3,300	10%	Y5P	.787	.236	.374	.032	20.0	6.0	9.5	.8	HT332K
4,700	20%	Y5U	.787	.236	.374	.032	20.0	6.0	9.5	.8	HT472M
6,800	20%	Y5U	.787	.236	.374	.032	20.0	6.0	9.5	.8	HT682M

EIA Class 3, Semiconductor Type
Disc Ceramic Capacitors

MALLORY



Reduced Titanite

- Ideal in Transistorized Circuity for Bypass and Coupling Applications
- Low Power Factor & Superior Radio Frequency Impedance Characteristics
- Meets RS-198C for Class 3 Ceramic Capacitors
- Radial Leads

GENERAL SPECIFICATIONS

Temperature Range:
-30°C to +85°C

Voltage Range:
25 & 50 VDC

Capacitance Range:
.01 μF to .22 μF

Lead Length: 1 inch minimum

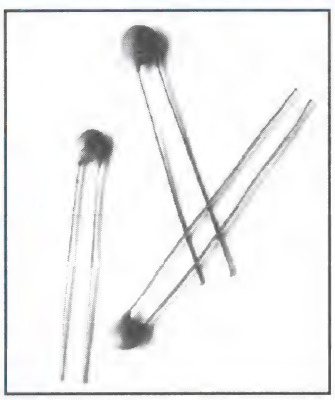
Insulation Resistance:
1 megohm (min)

Power Factor @ 1000 Hz:
7.0% Max

Breakdown Voltage:
2.5 x rated
(5 seconds Max)

Capacity μF	Tol	Temp Coef	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
25 WVDC											
.010	20%	Y5R	.235	.138	.250	.025	6.0	3.5	6.4	.6	LC103M
.022	20%	Y5R	.315	.138	.250	.025	8.0	3.5	6.4	.6	LC223M
.033	20%	Y5R	.350	.138	.250	.025	8.9	3.5	6.4	.6	LC333M
.100	20%	Y5R	.495	.138	.250	.025	12.6	3.5	6.4	.6	LC104M
.220	20%	Y5U	.495	.138	.250	.025	12.6	3.5	6.4	.6	LC224M

Capacity μF	Tol	Temp Coef	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
50 WVDC											
.010	20%	Y5U	.230	.138	.250	.025	5.8	3.5	6.4	.6	LE103M
.022	20%	Y5U	.290	.138	.250	.025	7.4	3.5	6.4	.6	LE223M
.047	20%	Y5U	.359	.138	.250	.025	9.1	3.5	6.4	.6	LE473M
.100	20%	Y5U	.484	.138	.250	.025	12.3	3.5	6.4	.6	LE104M



Spark-Arrestor

- Radial Leads
- 1 Inch Leads (minimum)
- Lead Material Tinned Copper Wire

GENERAL SPECIFICATIONS

Type 1 Spark-Arrestor

Consists of a wire loop encased in phenolic resin. After the loop has been encased, a precise slot is cut through the wire loop and its protective case to form a gap. Type 1 does not include a parallel disc ceramic.

Type 2 Spark-Arrestor

A combination of a ceramic disc in parallel with the gap. Useful in either industrial or commercial applications which require bypassing of transient over voltages. The precise gap allows the stray transients to be harmlessly bypassed.

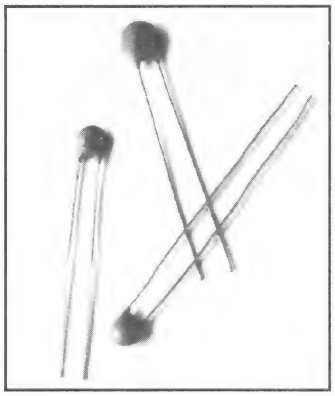
Temperature Characteristic = Z5U

Type 1 Type 2

Capacity	Voltage	Type	Size (Inches) D	H	S	d	Size (Millimeters) D	H	S	d	Catalog Number
1 - 3 KVDC											
* .75pF max	1-2 KVDC	1	.350	.500	.250	.032	8.9	12.7	6.4	.8	ASR75A
* .75pF max	2-3 KVDC	1	.350	.500	.250	.032	8.9	12.7	6.4	.8	ATR75A
# .01μF	2-3 KVDC	2	.770	1.000	.375	.032	19.6	25.4	9.5	.8	AT103A

* Inherent capacity of gap only. No parallel disc ceramic.
# Includes parallel disc ceramic. Tol. +80,-20%

X Type Across-The-Line Filter
Disc Ceramic Capacitors



- UL Recognized
  UL 1414, File E38785
- CSA Certified
  CSA 22.2#1, File LR33468
- VDE Recognized
  Specification 57-565-1
  Files: 13751-4670-1002/A1B
  13971-4670-1001/A2E

* For other X Type capacitors, see our 158X Film Capacitors on page 168

GENERAL SPECIFICATIONS

Temperature Coefficient:
Z5U
Voltage Range:
125 VAC or 2000 VDC
Capacitance Range:
.001 μF to .01 μF
Capacity Tolerance:
±20%
Dielectric Strength:
3250 vrms minimum for 2 minutes
Lead Material:
Tin Plated Copper
Dissipation Factor:
2.5% Max at 25°C
Operating Temperature:
+10°C to +85°C
Case Breakdown:
> 1000 VAC (RMS) at 60Hz for 1 minute
Insulation Resistance:
10K megohms @ 25°C
Discharge Tests:
220 VAC @ 85°C for 42 days, then cycle at 1/10 sec/hr. for 42 days at 440 VAC 50% humidity

Capacity μF	Tol	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
125 VAC (rms) / 2000 VDC										
.001	20%	.472	.315	.375	.032	12.0	8.0	9.5	.8	UN102M
.0015	20%	.472	.315	.375	.032	12.0	8.0	9.5	.8	UN152M
.002	20%	.472	.315	.375	.032	12.0	8.0	9.5	.8	UN202M
.003	20%	.590	.315	.375	.032	15.0	8.0	9.5	.8	UN302M
.0047	20%	.748	.315	.375	.032	19.0	8.0	9.5	.8	UN472M

Capacity μF	Tol	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
125 VAC (rms) / 2000 VDC										
.005	20%	.748	.315	.375	.032	19.0	8.0	9.5	.8	UN502M
.0068	20%	.787	.315	.375	.032	20.0	8.0	9.5	.8	UN682M
.01	20%	.905	.315	.500	.032	23.0	8.0	12.7	.8	UN103M
.01	20%	.905	.315	.375	.032	23.0	8.0	9.5	.8	UN103MS

X1-Y1 Type Across-The-Line, Antenna Coupling & Line By Pass
Disc Ceramic Capacitors

NEW

- UL Recognized
  UL 1283, UL 1414 File E89615
- CSA Certified
  CSA 22.2#1, File LR701398
- VDE Certified
  Files: 95414, 95415, 95416
- SEV Certified
  Files: 96, 5 50522, 06
- SEMKO Certified
  File: 9612104-01
- NEMKO Certified
  File: P96101248
- DEMKO Certified
  File: 305416
- FIMKO Certified
  File: 190124-01

GENERAL SPECIFICATIONS

Temperature Coefficient:
Y5U
Voltage Range:
250 VAC
Capacitance Range:
100 pF to .01 μF
Capacity Tolerance:
±10%, ±20%
Dielectric Strength:
4000 vrms minimum for 1 minute
Dissipation Factor:
2.0% Max
Operating Temperature:
-30°C to +85°C

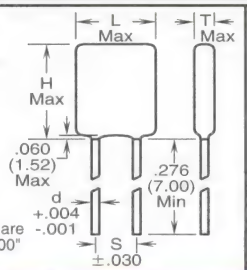
Capacity pF	Tol	Size (Inches) D	T	S	d	Size (Millimeters) D	T	S	d	Catalog Number
250 VAC										
100	10%	.331	.220	.375	.031	8.4	5.6	9.5	.8	UXY101K
150	10%	.331	.236	.375	.031	8.4	6.0	9.5	.8	UXY151K
220	10%	.331	.236	.375	.031	8.4	6.0	9.5	.8	UXY221K
330	10%	.331	.224	.375	.031	8.4	5.7	9.5	.8	UXY331K
470	10%	.331	.228	.375	.031	8.4	5.8	9.5	.8	UXY471K
560	10%	.331	.228	.375	.031	8.4	5.8	9.5	.8	UXY561K
680	20%	.331	.236	.375	.031	8.4	6.0	9.5	.8	UXY681M
1000	20%	.402	.240	.375	.031	10.2	6.1	9.5	.8	UXY102M
1500	20%	.461	.236	.375	.031	11.7	6.0	9.5	.8	UXY152M
2200	20%	.461	.228	.375	.031	11.7	5.8	9.5	.8	UXY222M
3300	20%	.559	.236	.375	.031	14.2	6.0	9.5	.8	UXY332M
3900	20%	.618	.232	.375	.031	15.7	5.9	9.5	.8	UXY392M
4700	20%	.681	.228	.375	.031	17.3	5.8	9.5	.8	UXY472M
5000	20%	.681	.230	.375	.031	17.3	5.8	9.5	.8	UXY502M
6800	20%	.790	.235	.375	.031	20.1	6.0	9.5	.8	UXY682M
.01μF	20%	.902	.230	.375	.031	22.9	5.8	9.5	.8	UXY103M

Index and Dimensions
Multilayer Ceramic Capacitors

MALLORY

Type	Style	Capacitance Range	Voltages	Dimensions (Inches) L	H	T	S	d	Dimensions (Millimeters) L	H	T	S	d	Page Number
Radial Leaded														
M15	Standard - Conformally Coated	1.0pF to .1μF	50, 100, 200	.150	.210	.100	.100	.020	3.8	5.3	2.5	2.5	.51	157
M20	Standard - Conformally Coated	1.0pF to .56μF	50, 100, 200	.200	.260	.125	.100	.020	5.1	6.6	3.2	2.5	.51	
M22	Standard - Conformally Coated	1.0pF to .56μF	50, 100, 200	.200	.260	.125	.200	.020	5.1	6.6	3.2	5.1	.51	
M30	Standard - Conformally Coated	2700pF to 1.8μF	50, 100, 200	.300	.360	.150	.200	.020	7.6	9.1	3.8	5.1	.51	
M40	Standard - Conformally Coated	.012μF to 4.7μF	50, 100, 200	.400	.460	.150	.200	.020	10.2	11.7	3.8	5.1	.51	
M50	Standard - Conformally Coated	.039μF to 6.8μF	50, 100, 200	.500	.560	.200	.400	.025	12.7	14.2	5.1	10.2	.64	
M60	Standard - Conformally Coated	.1μF to 100μF	25, 50, 100, 250	See Standard Parts List										161
CK05	MIL-C-11015/18 - Molded	10pF to .1μF	50, 100, 200	.190	.190	.090	.200	.025	4.8	4.8	2.3	5.1	.64	164
CKR05	MIL-C-39014/01 - Molded	10pF to .1μF	50, 100, 200	.190	.190	.090	.200	.025	4.8	4.8	2.3	5.1	.64	
CK06	MIL-C-11015/19 - Molded	1200pF to 1.0μF	50, 100, 200	.290	.290	.090	.200	.025	7.4	7.4	2.3	5.1	.64	165
CKR06	MIL-C-39014/02 - Molded	1200pF to 1.0μF	50, 100, 200	.290	.290	.090	.200	.025	7.4	7.4	2.3	5.1	.64	

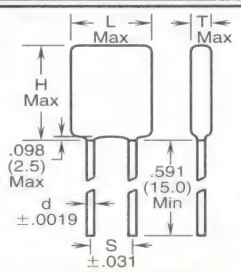
M15 M20 M22* M30 M40 M50



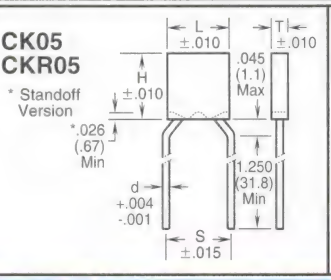
Longer lead lengths are available

*M22 Leads are formed to .200" spacing.

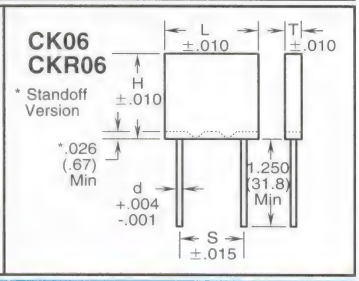
M60



CK05 CKR05

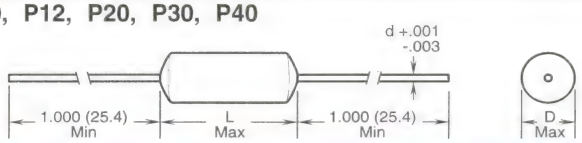


CK06 CKR06

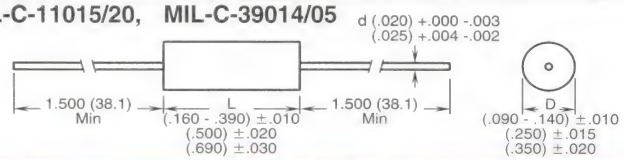


Type	Style	Capacitance Range	Voltages	Dimensions (Inches) D	L	d	Dimensions (Millimeters) D	L	d	Page Number
Axial Leaded										
P10	Standard - Conformally Coated	10pF to .22μF	50, 100, 200	.100	.170	.020	2.5	4.3	.51	162
P12	Standard - Conformally Coated	1200pF to .33μF	50, 100	.120	.170	.020	3.1	4.3	.51	
P20	Standard - Conformally Coated	560pF to .33μF	50, 100	.100	.260	.020	2.5	6.6	.51	
P30	Standard - Conformally Coated	1800pF to .47μF	50, 100	.150	.290	.020	3.8	7.4	.51	
P40	Standard - Conformally Coated	5600pF to 1.0μF	50, 100	.150	.400	.020	3.8	10.2	.51	
CK12	MIL-C-11015/20 - Molded	10pF to .01μF	50, 100	.090	.160	.020	2.3	4.0	.51	165
CKR11	MIL-C-39014/05 - Molded	10pF to .01μF	50, 100	.090	.160	.020	2.3	4.0	.51	
CK13	MIL-C-11015/20 - Molded	5600pF to .047μF	50, 100	.090	.250	.020	2.3	6.4	.51	166
CKR12	MIL-C-39014/05 - Molded	5600pF to .047μF	50, 100	.090	.250	.020	2.3	6.4	.51	
CK14	MIL-C-11015/20 - Molded	.012μF to .27μF	50, 100	.140	.390	.025	3.6	9.9	.64	166
CKR14	MIL-C-39014/05 - Molded	.012μF to .27μF	50, 100	.140	.390	.025	3.6	9.9	.64	
CK15	MIL-C-11015/20 - Molded	.056μF to 1.0μF	50, 100	.250	.500	.025	6.4	12.7	.64	166
CKR15	MIL-C-39014/05 - Molded	.056μF to 1.0μF	50, 100	.250	.500	.025	6.4	12.7	.64	
CK16	MIL-C-11015/20 - Molded	.47μF to 3.3μF	50, 100	.350	.690	.025	8.9	17.5	.64	166
CKR16	MIL-C-39014/05 - Molded	.47μF to 3.3μF	50, 100	.350	.690	.025	8.9	17.5	.64	

P10, P12, P20, P30, P40



MIL-C-11015/20, MIL-C-39014/05



Type	Size Codes	Capacitance Range	Voltages	Dimensions	Page
CHIPS	0402, 0603, 0805, 1206, 1210	.5 pF to 2.2μF	10, 16, 25, 50, 100, 200	See Standard Parts List	167

Performance Characteristics
Multilayer Ceramic Capacitors

MALLORY

The EIA Standard for ceramic dielectric capacitors (RS-198C) divides into three classes.
NACC multilayer ceramic capacitors are available in the three most popular temperature characteristics:

COG: Class I (Also known as 'NPO')
Temperature Compensating capacitors, suitable for resonant circuits where stable capacitance and high Q are necessary. They are made of non ferro-electric materials yielding superior stability and low volumetric efficiency.

X7R: Class II
Stable capacitors, made of ferro-electric materials, yielding higher volumetric efficiency but less stability.These capacitors are suitable for by-pass or coupling applications where stability and Q are not a major factor.

Z5U: Class III
General Purpose capacitors, suitable for bypass coupling where dielectric losses, high insulation resistance and stability are not required. Made of ferro-electric materials, Class III capacitors have the lowest stability, but the highest volumetric efficiency.

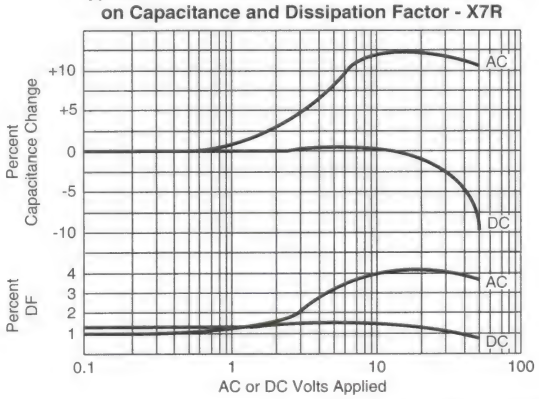
Parameter	COG (NPO)	X7R	Z5U
Temperature Characteristics:			
Range, °C:	-55°C to +125°C	-55°C to +125°C	+10°C to +85°C
Capacitance change without DC voltage:	0 ±30 PPM/°C *	±15 %	+22 %, -56 %
Aging Rate: % ΔC / Decade Hour, Maximum:.	0 %	2.5 %	5.0 %
Dissipation Factor:			
Test Conditions @ 25°C:	>1000 pF w/1.0 vrms @ 1 kHz. ≤ 1000 pF w/1.0 vrms @ 1 MHz.	w/ 1.0 vrms @ 1 kHz.	w/ 0.5 vrms @ 1 kHz.
Limits:	0.15 % Max.	2.5 % Max.	3.0 % Max..
Insulation Resistance (IR):			
At rated voltage, whichever is smaller:	1000 megohms x μF or 100 gigaohms	1000 megohms x μF or 100 gigaohms	1000 megohms x μF or 10 gigaohms
Moisture Resistance: EIA RS-198C, Method B2, Condition A (10 cycles without applied voltage)			
Post test limits @ 25°C, whichever is smaller:	100 megohms x μF or 10 gigaohms	100 megohms x μF or 10 gigaohms	100 megohms x μF or 1 gigaohm
Immersion Cycling: EIA RS-198C Method D2, Condition A (2 cycles @ 15 minutes each. Each cycle consists of immersion in hot bath @ 65°C followed by immersion in cold tap water.)			
Post test limits @ 25°C :			
Insulation Resistance, whichever is smaller:	100 megohms x μF or 10 gigaohms	100 megohms x μF or 10 gigaohms	100 megohms x μF or 1 gigaohm
Life Test: - 1000 Hrs.			
Test Potential and Temperature:	200 % V @ 125°C	200 % V @ 125°C	150 % V @ 85°C
Post test limits @ 25°C:			
Capacitance Change, whichever is greater:	±2% or 0.5pF	±20% of initial value**	±30 % of initial value**
Dissipation Factor:	0.25 % Max.	3.0 % Max.	4.0 % Max.
Insulation Resistance,whichever is smaller:	100 megohms x μF or 10 gigaohms	100 megohms x μF or 10 gigaohms	100 megohms x μF or 1 gigaohm
Dielectric Strength 2.5 times rated voltage with current limited to 50 mA.			

* 60 PPM°C below 10pF nominal.
+53 PPM -30 PPM/°C from +25°C to -55°C comparable to MIL-C-20

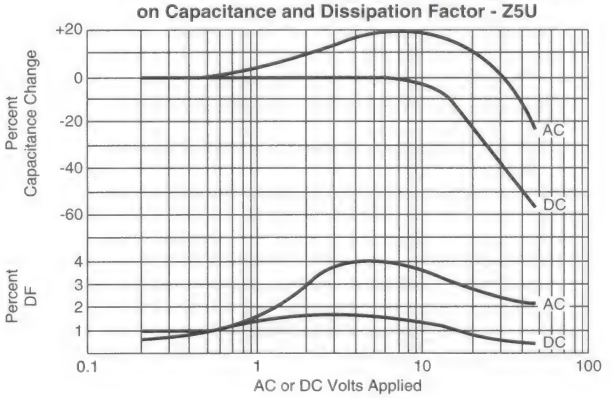
** X7R and Z5U dielectrics exhibit aging characteristics; therefore, it is highly recommended that capacitors be de-aged for 2 hours @ 150°C and stabilized at room temperature for 48 hours before capacitor measurements are made.

Effect of Applied Voltage

Typical Effect of 1000 Hz AC and DC Voltage Level on Capacitance and Dissipation Factor - X7R

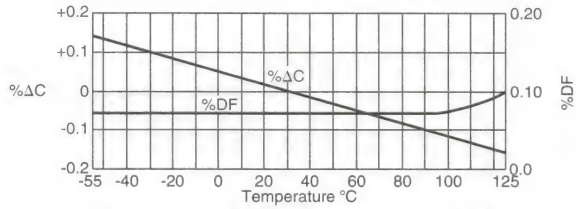


Typical Effect of 1000 Hz AC and DC Voltage Level on Capacitance and Dissipation Factor - Z5U

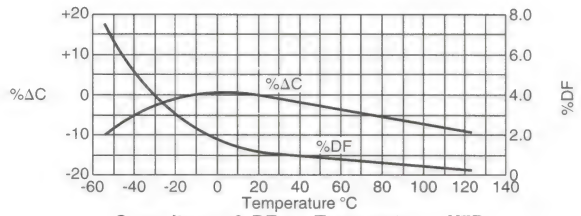


Note: COG Dielectric capacitance and dissipation factor are stable with voltage

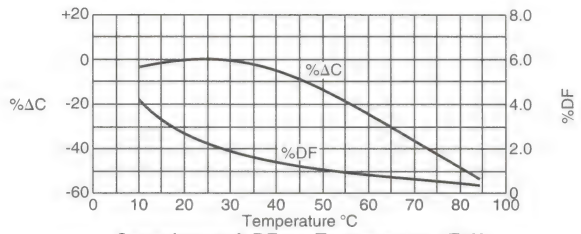
Effect of Temperature



Capacitance & DF vs. Temperature - COG

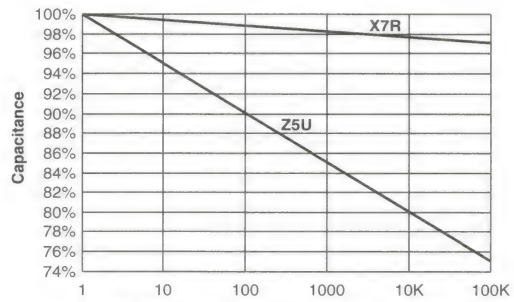


Capacitance & DF vs. Temperature - X7R



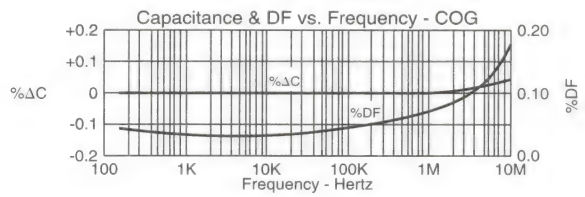
Capacitance & DF vs. Temperature - Z5U

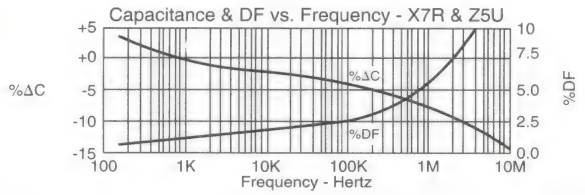
Effect of Time



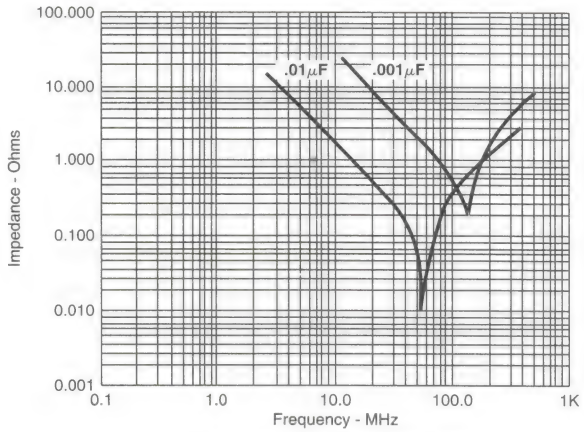
Typical Aging Rates for X7R and Z5U

Effect of Frequency

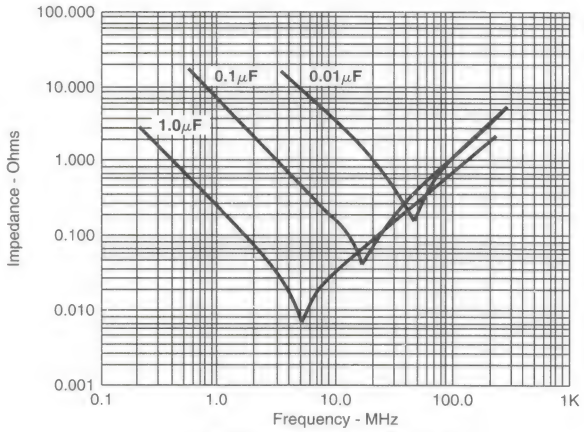




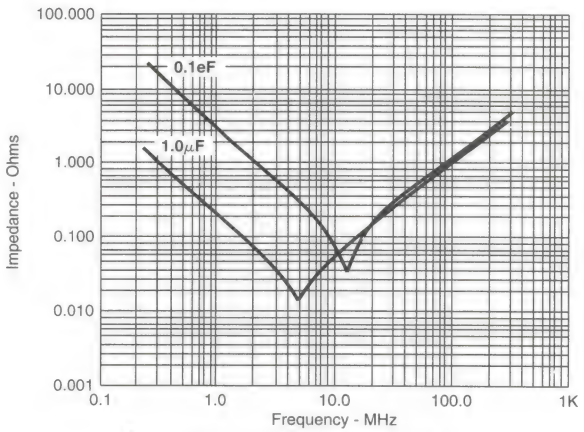
Impedance vs. Frequency



Impedance vs. Frequency for COG Dielectric



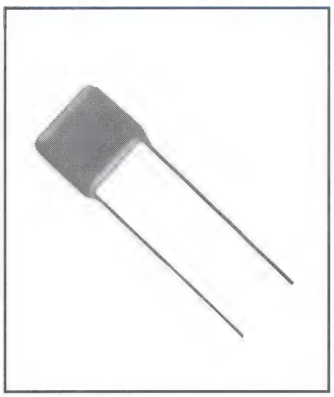
Impedance vs. Frequency for X7R Dielectric



Impedance vs. Frequency for Z5U Dielectric

M15 to M50 Series
Multilayer Ceramic Capacitors

MALLORY



- Radial Leaded Conformally Coated
- Encapsulation consists of a moisture and shock resistant coating that meets UL94V-0
- Over 300 CV values available
- Applications : Filtering, Bypass, Coupling
- IECQ Approved to:
  QC300601/US0002 - NPO
  QC300701/US0002 - X7R
  QC300701/US0004 - Z5U
- Available in 1-1/4" Lead length As a Non Standard Item

GENERAL SPECIFICATIONS

Voltage Range:
50, 100, 200 VDC

Capacitance Range:
1 pF to 6.8 μF

Temperature Coefficients:
COG(NPO), X7R, Z5U

Available in Tape and Reel configuration:
Add 'TR' to end of catalog number.

COG (NPO) Temperature Coefficient
200 VOLTS

Capacity	Size (Inches) L	H	T	S	Catalog Number
1.0 pF	.150	.210	.100	.100	M15G109D2
1.0 pF	.200	.260	.125	.100	M20G109D2
1.0 pF	.200	.260	.125	.200	M22G109D2
1.5 pF	.150	.210	.100	.100	M15G159D2
1.5 pF	.200	.260	.125	.100	M20G159D2
1.5 pF	.200	.260	.125	.200	M22G159D2
2.2 pF	.150	.210	.100	.100	M15G229D2
2.2 pF	.200	.260	.125	.100	M20G229D2
2.2 pF	.200	.260	.125	.200	M22G229D2
2.7 pF	.150	.210	.100	.100	M15G279D2
2.7 pF	.200	.260	.125	.100	M20G279D2
2.7 pF	.200	.260	.125	.200	M22G279D2
3.3 pF	.150	.210	.100	.100	M15G339D2
3.3 pF	.200	.260	.125	.100	M20G339D2
3.3 pF	.200	.260	.125	.200	M22G339D2
3.9 pF	.150	.210	.100	.100	M15G399D2
3.9 pF	.200	.260	.125	.100	M20G399D2
3.9 pF	.200	.260	.125	.200	M22G399D2
4.7 pF	.150	.210	.100	.100	M15G479D2
4.7 pF	.200	.260	.125	.100	M20G479D2
4.7 pF	.200	.260	.125	.200	M22G479D2
5.6 pF	.150	.210	.100	.100	M15G569D2
5.6 pF	.200	.260	.125	.100	M20G569D2
5.6 pF	.200	.260	.125	.200	M22G569D2
6.8 pF	.150	.210	.100	.100	M15G689D2
6.8 pF	.200	.260	.125	.100	M20G689D2
6.8 pF	.200	.260	.125	.200	M22G689D2
8.2 pF	.150	.210	.100	.100	M15G829D2
8.2 pF	.200	.260	.125	.100	M20G829D2
8.2 pF	.200	.260	.125	.200	M22G829D2
10 pF	.150	.210	.100	.100	M15G100*2
10 pF	.200	.260	.125	.100	M20G100*2
10 pF	.200	.260	.125	.200	M22G100*2
12 pF	.150	.210	.100	.100	M15G120*2
12 pF	.200	.260	.125	.100	M20G120*2
12 pF	.200	.260	.125	.200	M22G120*2
15 pF	.150	.210	.100	.100	M15G150*2
15 pF	.200	.260	.125	.100	M20G150*2
15 pF	.200	.260	.125	.200	M22G150*2
18 pF	.150	.210	.100	.100	M15G180*2
18 pF	.200	.260	.125	.100	M20G180*2
18 pF	.200	.260	.125	.200	M22G180*2
22 pF	.150	.210	.100	.100	M15G220*2
22 pF	.200	.260	.125	.100	M20G220*2
22 pF	.200	.260	.125	.200	M22G220*2
27 pF	.150	.210	.100	.100	M15G270*2
27 pF	.200	.260	.125	.100	M20G270*2
27 pF	.200	.260	.125	.200	M22G270*2
33 pF	.150	.210	.100	.100	M15G330*2
33 pF	.200	.260	.125	.100	M20G330*2
33 pF	.200	.260	.125	.200	M22G330*2
39 pF	.150	.210	.100	.100	M15G390*2
39 pF	.200	.260	.125	.100	M20G390*2
39 pF	.200	.260	.125	.200	M22G390*2
47 pF	.150	.210	.100	.100	M15G470*2
47 pF	.200	.260	.125	.100	M20G470*2
47 pF	.200	.260	.125	.200	M22G470*2
56 pF	.150	.210	.100	.100	M15G560*2
56 pF	.200	.260	.125	.100	M20G560*2
56 pF	.200	.260	.125	.200	M22G560*2
68 pF	.150	.210	.100	.100	M15G680*2
68 pF	.200	.260	.125	.100	M20G680*2
68 pF	.200	.260	.125	.200	M22G680*2
82 pF	.150	.210	.100	.100	M15G820*2
82 pF	.200	.260	.125	.100	M20G820*2
82 pF	.200	.260	.125	.200	M22G820*2
100 pF	.150	.210	.100	.100	M15G101*2
100 pF	.200	.260	.125	.100	M20G101*2
100 pF	.200	.260	.125	.200	M22G101*2
120 pF	.150	.210	.100	.100	M15G121*2
120 pF	.200	.260	.125	.100	M20G121*2
120 pF	.200	.260	.125	.200	M22G121*2
150 pF	.150	.210	.100	.100	M15G151*2
150 pF	.200	.260	.125	.100	M20G151*2
150 pF	.200	.260	.125	.200	M22G151*2
180 pF	.150	.210	.100	.100	M15G181*2
180 pF	.200	.260	.125	.100	M20G181*2
180 pF	.200	.260	.125	.200	M22G181*2
220 pF	.150	.210	.100	.100	M15G221*2
220 pF	.200	.260	.125	.100	M20G221*2
220 pF	.200	.260	.125	.200	M22G221*2
270 pF	.150	.210	.100	.100	M15G271*2
270 pF	.200	.260	.125	.100	M20G271*2
270 pF	.200	.260	.125	.200	M22G271*2
330 pF	.150	.210	.100	.100	M15G331*2
330 pF	.200	.260	.125	.100	M20G331*2
330 pF	.200	.260	.125	.200	M22G331*2
390 pF	.150	.210	.100	.100	M15G391*2
390 pF	.200	.260	.125	.100	M20G391*2
390 pF	.200	.260	.125	.200	M22G391*2
470 pF	.150	.210	.100	.100	M15G471*2
470 pF	.200	.260	.125	.100	M20G471*2
470 pF	.200	.260	.125	.200	M22G471*2
560 pF	.200	.260	.125	.100	M20G561*2
560 pF	.200	.260	.125	.200	M22G561*2
680 pF	.200	.260	.125	.100	M20G681*2
680 pF	.200	.260	.125	.200	M22G681*2
820 pF	.200	.260	.125	.100	M20G821*2
820 pF	.200	.260	.125	.200	M22G821*2
1000 pF	.200	.260	.125	.100	M20G102*2
1000 pF	.200	.260	.125	.200	M22G102*2
1200 pF	.200	.260	.125	.100	M20G122*2
1200 pF	.200	.260	.125	.200	M22G122*2
1500 pF	.200	.260	.125	.100	M20G152*2
1500 pF	.200	.260	.125	.200	M22G152*2
1800 pF	.200	.260	.125	.100	M20G182*2
1800 pF	.200	.260	.125	.200	M22G182*2
2200 pF	.200	.260	.125	.100	M20G222*2
2200 pF	.200	.260	.125	.200	M22G222*2
2700 pF	.200	.260	.125	.100	M20G272*2
2700 pF	.200	.260	.125	.200	M22G272*2
2700 pF	.300	.360	.150	.200	M30G272*2
3300 pF	.200	.260	.125	.100	M20G332*2
3300 pF	.200	.260	.125	.200	M22G332*2
3300 pF	.300	.360	.150	.200	M30G332*2
3900 pF	.300	.360	.150	.200	M30G392*2
4700 pF	.300	.360	.150	.200	M30G472*2
5600 pF	.300	.360	.150	.200	M30G562*2
6800 pF	.300	.360	.150	.200	M30G682*2
8200 pF	.300	.360	.150	.200	M30G822*2
.01 uF	.300	.360	.150	.200	M30G103*2
.012 uF	.300	.360	.150	.200	M30G123*2
.012 uF	.400	.460	.150	.200	M40G123*2
.015 uF	.300	.360	.150	.200	M30G153*2
.015 uF	.400	.460	.150	.200	M40G153*2
.018 uF	.300	.360	.150	.200	M30G183*2
.018 uF	.400	.460	.150	.200	M40G183*2
.022 uF	.400	.460	.150	.200	M40G223*2
.027 uF	.400	.460	.150	.200	M40G273*2
.033 uF	.400	.460	.150	.200	M40G333*2
.039 uF	.400	.460	.150	.200	M40G393*2
.039 uF	.500	.560	.200	.400	M50G393*2
.047 uF	.400	.460	.150	.200	M40G473*2
.047 uF	.500	.560	.200	.400	M50G473*2
.056 uF	.500	.560	.200	.400	M50G563*2
.068 uF	.500	.560	.200	.400	M50G683*2

Add 'TR' to end of part number for Tape & Reel
M15, M20, M22 - 2,500 per reel
M30 - 1,500 per reel
M40 - 1,000 per reel
M50 - N/A
(Available in full reels only)

* Insert proper letter symbol for tolerance:
(1 pF to 8.2 pF available in D = ±.5 pF only)
10 pF to 22 pF: J = ±5%, K = ±10%
27 pF to 47 pF: G = ±2%, J = ±5%, K = ±10%
56 pF & Up: F = ±1%, G = ±2%, J = ±5%, K = ±10%

M15 to M50 Series
Multilayer Ceramic Capacitors

MALLORY

COG (NPO) Temperature Coefficient
100 VDC

Capacity	Size (Inches) L	H	T	S	Catalog Number
120 pF	.150	.210	.100	.100	M15G121*1
150 pF	.150	.210	.100	.100	M15G151*1
180 pF	.150	.210	.100	.100	M15G181*1
220 pF	.150	.210	.100	.100	M15G221*1
270 pF	.150	.210	.100	.100	M15G271*1
330 pF	.150	.210	.100	.100	M15G331*1
390 pF	.150	.210	.100	.100	M15G391*1
470 pF	.150	.210	.100	.100	M15G471*1
560 pF	.150	.210	.100	.100	M15G561*1
680 pF	.150	.210	.100	.100	M15G681*1
680 pF	.200	.260	.125	.100	M20G681*1
680 pF	.200	.260	.125	.200	M22G681*1
820 pF	.150	.210	.100	.100	M15G821*1
820 pF	.200	.260	.125	.100	M20G821*1
820 pF	.200	.260	.125	.200	M22G821*1
1000 pF	.150	.210	.100	.100	M15G102*1
1000 pF	.200	.260	.125	.100	M20G102*1
1000 pF	.200	.260	.125	.200	M22G102*1
1200 pF	.200	.260	.125	.100	M20G122*1
1200 pF	.200	.260	.125	.200	M22G122*1
1500 pF	.200	.260	.125	.100	M20G152*1
1500 pF	.200	.260	.125	.200	M22G152*1
1800 pF	.200	.260	.125	.100	M20G182*1
1800 pF	.200	.260	.125	.200	M22G182*1
2200 pF	.200	.260	.125	.100	M20G222*1
2200 pF	.200	.260	.125	.200	M22G222*1
2700 pF	.200	.260	.125	.100	M20G272*1
2700 pF	.200	.260	.125	.200	M22G272*1
3300 pF	.200	.260	.125	.100	M20G332*1
3300 pF	.200	.260	.125	.200	M22G332*1
3300 pF	.300	.360	.150	.200	M30G332*1
3900 pF	.200	.260	.125	.100	M20G392*1
3900 pF	.200	.260	.125	.200	M22G392*1
3900 pF	.300	.360	.150	.200	M30G392*1
4700 pF	.200	.260	.125	.100	M20G472*1
4700 pF	.200	.260	.125	.200	M22G472*1
4700 pF	.300	.360	.150	.200	M30G472*1
5600 pF	.200	.260	.125	.100	M20G562*1
5600 pF	.200	.260	.125	.200	M22G562*1
5600 pF	.300	.360	.150	.200	M30G562*1
6800 pF	.300	.360	.150	.200	M30G682*1
8200 pF	.300	.360	.150	.200	M30G822*1
.01 uF	.300	.360	.150	.200	M30G103*1
.012 uF	.300	.360	.150	.200	M30G123*1
.015 uF	.300	.360	.150	.200	M30G153*1
.018 uF	.300	.360	.150	.200	M30G183*1
.022 uF	.300	.360	.150	.200	M30G223*1
.027 uF	.300	.360	.150	.200	M30G273*1
.027 uF	.400	.460	.150	.200	M40G273*1
.033 uF	.400	.460	.150	.200	M40G333*1
.039 uF	.400	.460	.150	.200	M40G393*1
.039 uF	.500	.560	.200	.400	M50G393*1
.047 uF	.400	.460	.150	.200	M40G473*1
.047 uF	.500	.560	.200	.400	M50G473*1
.056 uF	.400	.460	.150	.200	M40G563*1
.056 uF	.500	.560	.200	.400	M50G563*1
.068 uF	.400	.460	.150	.200	M40G683*1
.068 uF	.500	.560	.200	.400	M50G683*1
.082 uF	.500	.560	.200	.400	M50G823*1
.1 uF	.500	.560	.200	.400	M50G104*1
.12 uF	.500	.560	.200	.400	M50G124*1

* Insert proper letter symbol for tolerance:
F = ±1%, G = ±2%, J = ±5%, K = ±10%

X7R Temperature Coefficient
200 VDC

Capacity	Size (Inches) L	H	T	S	Catalog Number
100 pF	.150	.210	.100	.100	M15R101*2
120 pF	.150	.210	.100	.100	M15R121*2
150 pF	.150	.210	.100	.100	M15R151*2
180 pF	.150	.210	.100	.100	M15R181*2
220 pF	.150	.210	.100	.100	M15R221*2
270 pF	.150	.210	.100	.100	M15R271*2
330 pF	.150	.210	.100	.100	M15R331*2
390 pF	.150	.210	.100	.100	M15R391*2
470 pF	.150	.210	.100	.100	M15R471*2
560 pF	.150	.210	.100	.100	M15R561*2
680 pF	.150	.210	.100	.100	M15R681*2
820 pF	.150	.210	.100	.100	M15R821*2
1000 pF	.150	.210	.100	.100	M15R102*2
1000 pF	.200	.260	.125	.100	M20R102*2
1000 pF	.200	.260	.125	.200	M22R102*2
1200 pF	.150	.210	.100	.100	M15R122*2
1200 pF	.200	.260	.125	.100	M20R122*2
1200 pF	.200	.260	.125	.200	M22R122*2
1500 pF	.150	.210	.100	.100	M15R152*2
1500 pF	.200	.260	.125	.100	M20R152*2
1500 pF	.200	.260	.125	.200	M22R152*2
1800 pF	.150	.210	.100	.100	M15R182*2
1800 pF	.200	.260	.125	.100	M20R182*2
1800 pF	.200	.260	.125	.200	M22R182*2
2200 pF	.150	.210	.100	.100	M15R222*2
2200 pF	.200	.260	.125	.100	M20R222*2
2200 pF	.200	.260	.125	.200	M22R222*2
2700 pF	.200	.260	.125	.100	M20R272*2
2700 pF	.200	.260	.125	.200	M22R272*2
3300 pF	.200	.260	.125	.100	M20R332*2
3300 pF	.200	.260	.125	.200	M22R332*2
3900 pF	.200	.260	.125	.100	M20R392*2
3900 pF	.200	.260	.125	.200	M22R392*2
4700 pF	.200	.260	.125	.100	M20R472*2
4700 pF	.200	.260	.125	.200	M22R472*2
5600 pF	.200	.260	.125	.100	M20R562*2
5600 pF	.200	.260	.125	.200	M22R562*2
6800 pF	.200	.260	.125	.100	M20R682*2
6800 pF	.200	.260	.125	.200	M22R682*2
8200 pF	.200	.260	.125	.100	M20R822*2
8200 pF	.200	.260	.125	.200	M22R822*2
.01 uF	.200	.260	.125	.100	M20R103*2
.01 uF	.200	.260	.125	.200	M22R103*2
.012 uF	.200	.260	.125	.100	M20R123*2
.012 uF	.200	.260	.125	.200	M22R123*2
.015 uF	.200	.260	.125	.100	M20R153*2
.015 uF	.200	.260	.125	.200	M22R153*2
.015 uF	.300	.360	.150	.200	M30R153*2
.018 uF	.200	.260	.125	.100	M20R183*2
.018 uF	.200	.260	.125	.200	M22R183*2
.018 uF	.300	.360	.150	.200	M30R183*2
.022 uF	.200	.260	.125	.100	M20R223*2
.022 uF	.200	.260	.125	.200	M22R223*2
.022 uF	.300	.360	.150	.200	M30R223*2
.027 uF	.300	.360	.150	.200	M30R273*2
.033 uF	.300	.360	.150	.200	M30R333*2
.039 uF	.300	.360	.150	.200	M30R393*2
.047 uF	.300	.360	.150	.200	M30R473*2
.056 uF	.300	.360	.150	.200	M30R563*2
.068 uF	.300	.360	.150	.200	M30R683*2
.082 uF	.300	.360	.150	.200	M30R823*2
.082 uF	.400	.460	.150	.200	M40R823*2
.1 uF	.300	.360	.150	.200	M30R104*2
.1 uF	.400	.460	.150	.200	M40R104*2
.12 uF	.400	.460	.150	.200	M40R124*2
.15 uF	.400	.460	.150	.200	M40R154*2
.18 uF	.400	.460	.150	.200	M40R184*2
.22 uF	.400	.460	.150	.200	M40R224*2
.22 uF	.500	.560	.200	.400	M50R224*2
.27 uF	.400	.460	.150	.200	M40R274*2
.27 uF	.500	.560	.200	.400	M50R274*2
.33 uF	.500	.560	.200	.400	M50R334*2
.39 uF	.500	.560	.200	.400	M50R394*2
.47 uF	.500	.560	.200	.400	M50R474*2

* Insert proper letter symbol for tolerance:
K = ±10%, M = ±20%

Add 'TR' to end of part number for Tape & Reel
M15, M20, M22 - 2,500 per reel
M30 - 1,500 per reel
M40 - 1,000 per reel
M50 - N/A
(Available in full reels only)

M15 to M50 Series
Multilayer Ceramic Capacitors

MALLORY

X7R Temperature Coefficient
100 VDC

Capacity	Size (Inches) L	H	T	S	Catalog Number
820 pF	.150	.210	.100	.100	M15R821*1
1000 pF	.150	.210	.100	.100	M15R102*1
1200 pF	.150	.210	.100	.100	M15R122*1
1500 pF	.150	.210	.100	.100	M15R152*1
1800 pF	.150	.210	.100	.100	M15R182*1
2200 pF	.150	.210	.100	.100	M15R222*1
2700 pF	.150	.210	.100	.100	M15R272*1
3300 pF	.150	.210	.100	.100	M15R332*1
3900 pF	.150	.210	.100	.100	M15R392*1
4700 pF	.150	.210	.100	.100	M15R472*1
4700 pF	.200	.260	.125	.100	M20R472*1
4700 pF	.200	.260	.125	.200	M22R472*1
5600 pF	.150	.210	.100	.100	M15R562*1
5600 pF	.200	.260	.125	.100	M20R562*1
5600 pF	.200	.260	.125	.200	M22R562*1
6800 pF	.150	.210	.100	.100	M15R682*1
6800 pF	.200	.260	.125	.100	M20R682*1
6800 pF	.200	.260	.125	.200	M22R682*1
8200 pF	.150	.210	.100	.100	M15R822*1
8200 pF	.200	.260	.125	.100	M20R822*1
8200 pF	.200	.260	.125	.200	M22R822*1
.01 uF	.150	.210	.100	.100	M15R103*1
.01 uF	.200	.260	.125	.100	M20R103*1
.01 uF	.200	.260	.125	.200	M22R103*1

Capacity	Size (Inches) L	H	T	S	Catalog Number
.012 uF	.200	.260	.125	.100	M20R123*1
.012 uF	.200	.260	.125	.200	M22R123*1
.015 uF	.200	.260	.125	.100	M20R153*1
.015 uF	.200	.260	.125	.200	M22R153*1
.018 uF	.200	.260	.125	.100	M20R183*1
.018 uF	.200	.260	.125	.200	M22R183*1
.022 uF	.200	.260	.125	.100	M20R223*1
.022 uF	.200	.260	.125	.200	M22R223*1
.027 uF	.200	.260	.125	.100	M20R273*1
.027 uF	.200	.260	.125	.200	M22R273*1
.033 uF	.200	.260	.125	.100	M20R333*1
.033 uF	.200	.260	.125	.200	M22R333*1
.039 uF	.200	.260	.125	.100	M20R393*1
.039 uF	.200	.260	.125	.200	M22R393*1
.047 uF	.200	.260	.125	.100	M20R473*1
.047 uF	.200	.260	.125	.200	M22R473*1
.056 uF	.200	.260	.125	.100	M20R563*1
.056 uF	.200	.260	.125	.200	M22R563*1
.068 uF	.200	.260	.125	.100	M20R683*1
.068 uF	.200	.260	.125	.200	M22R683*1
.068 uF	.300	.360	.150	.200	M30R683*1
.082 uF	.200	.260	.125	.100	M20R823*1
.082 uF	.200	.260	.125	.200	M22R823*1
.082 uF	.300	.360	.150	.200	M30R823*1

Capacity	Size (Inches) L	H	T	S	Catalog Number
.1 uF	.200	.260	.125	.100	M20R104*1
.1 uF	.200	.260	.125	.200	M22R104*1
.1 uF	.300	.360	.150	.200	M30R104*1
.12 uF	.300	.360	.150	.200	M30R124*1
.15 uF	.300	.360	.150	.200	M30R154*1
.18 uF	.300	.360	.150	.200	M30R184*1
.22 uF	.300	.360	.150	.200	M30R224*1
.27 uF	.300	.360	.150	.200	M30R274*1
.33 uF	.300	.360	.150	.200	M30R334*1
.33 uF	.400	.460	.150	.200	M40R334*1
.39 uF	.300	.360	.150	.200	M30R394*1
.39 uF	.400	.460	.150	.200	M40R394*1
.47 uF	.300	.360	.150	.200	M30R474*1
.47 uF	.400	.460	.150	.200	M40R474*1
.56 uF	.400	.460	.150	.200	M40R564*1
.68 uF	.400	.460	.150	.200	M40R684*1
.68 uF	.500	.560	.200	.400	M50R684*1
.82 uF	.400	.460	.150	.200	M40R824*1
.82 uF	.500	.560	.200	.400	M50R824*1
1.0 uF	.400	.460	.150	.200	M40R105*1
1.0 uF	.500	.560	.200	.400	M50R105*1
1.2 uF	.500	.560	.200	.400	M50R125*1

* Insert proper letter symbol for tolerance:
K = ±10%, M = ±20%

X7R Temperature Coefficient
50 VDC

Capacity	Size (Inches) L	H	T	S	Catalog Number
3300 pF	.150	.210	.100	.100	M15R332*5
3900 pF	.150	.210	.100	.100	M15R392*5
4700 pF	.150	.210	.100	.100	M15R472*5
5600 pF	.150	.210	.100	.100	M15R562*5
6800 pF	.150	.210	.100	.100	M15R682*5
8200 pF	.150	.210	.100	.100	M15R822*5
.01 uF	.150	.210	.100	.100	M15R103*5
.012 uF	.150	.210	.100	.100	M15R123*5
.012 uF	.200	.260	.125	.100	M20R123*5
.012 uF	.200	.260	.125	.200	M22R123*5
.015 uF	.150	.210	.100	.100	M15R153*5
.015 uF	.200	.260	.125	.100	M20R153*5
.015 uF	.200	.260	.125	.200	M22R153*5
.018 uF	.150	.210	.100	.100	M15R183*5
.018 uF	.200	.260	.125	.100	M20R183*5
.018 uF	.200	.260	.125	.200	M22R183*5
.022 uF	.150	.210	.100	.100	M15R223*5
.022 uF	.200	.260	.125	.100	M20R223*5
.022 uF	.200	.260	.125	.200	M22R223*5
.027 uF	.150	.210	.100	.100	M15R273*5
.027 uF	.200	.260	.125	.100	M20R273*5
.027 uF	.200	.260	.125	.200	M22R273*5

Capacity	Size (Inches) L	H	T	S	Catalog Number
.033 uF	.150	.210	.100	.100	M15R333*5
.033 uF	.200	.260	.125	.100	M20R333*5
.033 uF	.200	.260	.125	.200	M22R333*5
.039 uF	.200	.260	.125	.100	M20R393*5
.039 uF	.200	.260	.125	.200	M22R393*5
.047 uF	.200	.260	.125	.100	M20R473*5
.047 uF	.200	.260	.125	.200	M22R473*5
.056 uF	.200	.260	.125	.100	M20R563*5
.056 uF	.200	.260	.125	.200	M22R563*5
.068 uF	.200	.260	.125	.100	M20R683*5
.068 uF	.200	.260	.125	.200	M22R683*5
.082 uF	.200	.260	.125	.100	M20R823*5
.082 uF	.200	.260	.125	.200	M22R823*5
.1 uF	.200	.260	.125	.100	M20R104*5
.1 uF	.200	.260	.125	.200	M22R104*5
.12 uF	.200	.260	.125	.100	M20R124*5
.12 uF	.200	.260	.125	.200	M22R124*5
.15 uF	.200	.260	.125	.100	M20R154*5
.15 uF	.200	.260	.125	.200	M22R154*5
.15 uF	.300	.360	.150	.200	M30R154*5
.18 uF	.200	.260	.125	.100	M20R184*5
.18 uF	.200	.260	.125	.200	M22R184*5
.18 uF	.300	.360	.150	.200	M30R184*5

Capacity	Size (Inches) L	H	T	S	Catalog Number
.22 uF	.200	.260	.125	.100	M20R224*5
.22 uF	.200	.260	.125	.200	M22R224*5
.22 uF	.300	.360	.150	.200	M30R224*5
.27 uF	.200	.260	.125	.100	M20R274*5
.27 uF	.200	.260	.125	.200	M22R274*5
.27 uF	.300	.360	.150	.200	M30R274*5
.33 uF	.300	.360	.150	.200	M30R334*5
.39 uF	.300	.360	.150	.200	M30R394*5
.47 uF	.300	.360	.150	.200	M30R474*5
.56 uF	.300	.360	.150	.200	M30R564*5
.68 uF	.300	.360	.150	.200	M30R684*5
.82 uF	.300	.360	.150	.200	M30R824*5
1.0 uF	.300	.360	.150	.200	M30R105*5
1.0 uF	.400	.460	.150	.200	M40R105*5
1.2 uF	.400	.460	.150	.200	M40R125*5
1.5 uF	.400	.460	.150	.200	M40R155*5
1.8 uF	.400	.460	.150	.200	M40R185*5
2.2 uF	.400	.460	.150	.200	M40R225*5
2.2 uF	.500	.560	.200	.400	M50R225*5
2.7 uF	.500	.560	.200	.400	M50R275*5
3.3 uF	.500	.560	.200	.400	M50R335*5
3.9 uF	.500	.560	.200	.400	M50R395*5

* Insert proper letter symbol for tolerance:
K = ±10%, M = ±20%

Add 'TR' to end of part number for Tape & Reel
M15, M20, M22 - 2,500 per reel
M30 - 1,500 per reel
M40 - 1,000 per reel
M50 - N/A
(Available in full reels only)

MALLORY

Z5U Temperature Coefficient
100 VDC

Capacity	Size (Inches) L	H	T	S	Catalog Number
1000 pF	.150	.210	.100	.100	M15U102*1
1200 pF	.150	.210	.100	.100	M15U122*1
1500 pF	.150	.210	.100	.100	M15U152*1
1800 pF	.150	.210	.100	.100	M15U182*1
2200 pF	.150	.210	.100	.100	M15U222*1
2700 pF	.150	.210	.100	.100	M15U272*1
3300 pF	.150	.210	.100	.100	M15U332*1
3900 pF	.150	.210	.100	.100	M15U392*1
4700 pF	.150	.210	.100	.100	M15U472*1
5600 pF	.150	.210	.100	.100	M15U562*1
6800 uF	.150	.210	.100	.100	M15U682*1
8200 pF	.150	.210	.100	.100	M15U822*1
.01 uF	.150	.210	.100	.100	M15U103*1
.01 uF	.200	.260	.125	.100	M20U103*1
.01 uF	.200	.260	.125	.200	M22U103*1
.012 uF	.150	.210	.100	.100	M15U123*1
.012 uF	.200	.260	.125	.100	M20U123*1
.012 uF	.200	.260	.125	.200	M22U123*1
.015 uF	.150	.210	.100	.100	M15U153*1
.015 uF	.200	.260	.125	.100	M20U153*1
.015 uF	.200	.260	.125	.200	M22U153*1
.018 uF	.150	.210	.100	.100	M15U183*1
.018 uF	.200	.260	.125	.100	M20U183*1
.018 uF	.200	.260	.125	.200	M22U183*1
.022 uF	.200	.260	.125	.100	M20U223*1
.022 uF	.200	.260	.125	.200	M22U223*1
.027 uF	.200	.260	.125	.100	M20U273*1
.027 uF	.200	.260	.125	.200	M22U273*1
.033 uF	.200	.260	.125	.100	M20U333*1
.033 uF	.200	.260	.125	.200	M22U333*1
.039 uF	.200	.260	.125	.100	M20U393*1
.039 uF	.200	.260	.125	.200	M22U393*1
.047 uF	.200	.260	.125	.100	M20U473*1
.047 uF	.200	.260	.125	.200	M22U473*1
.056 uF	.200	.260	.125	.100	M20U563*1
.056 uF	.200	.260	.125	.200	M22U563*1
.068 uF	.200	.260	.125	.100	M20U683*1
.068 uF	.200	.260	.125	.200	M22U683*1
.082 uF	.200	.260	.125	.100	M20U823*1
.082 uF	.200	.260	.125	.200	M22U823*1
.1 uF	.200	.260	.125	.100	M20U104*1
.1 uF	.200	.260	.125	.200	M22U104*1
.1 uF	.300	.360	.150	.200	M30U104*1
.12 uF	.200	.260	.125	.100	M20U124*1
.12 uF	.200	.260	.125	.200	M22U124*1
.12 uF	.300	.360	.150	.200	M30U124*1
.15 uF	.200	.260	.125	.100	M20U154*1
.15 uF	.200	.260	.125	.200	M22U154*1
.15 uF	.300	.360	.150	.200	M30U154*1
.18 uF	.300	.360	.150	.200	M30U184*1
.22 uF	.300	.360	.150	.200	M30U224*1
.27 uF	.300	.360	.150	.200	M30U274*1
.33 uF	.300	.360	.150	.200	M30U334*1
.33 uF	.400	.460	.150	.200	M40U334*1
.39 uF	.300	.360	.150	.200	M30U394*1
.39 uF	.400	.460	.150	.200	M40U394*1
.47 uF	.300	.360	.150	.200	M30U474*1
.47 uF	.400	.460	.150	.200	M40U474*1
.56 uF	.400	.460	.150	.200	M40U564*1
.68 uF	.400	.460	.150	.200	M40U684*1
.82 uF	.400	.460	.150	.200	M40U824*1
1.0 uF	.400	.460	.150	.200	M40U105*1
1.0 uF	.500	.560	.200	.400	M50U105*1
1.2 uF	.400	.460	.150	.200	M40U125*1
1.2 uF	.500	.560	.200	.400	M50U125*1
1.5 uF	.400	.460	.150	.200	M40U155*1
1.5 uF	.500	.560	.200	.400	M50U155*1
1.8 uF	.500	.560	.200	.400	M50U185*1
2.2 uF	.500	.560	.200	.400	M50U225*1

* Insert proper letter symbol for tolerance:
M = ±20%, Z = + 80% - 20%, P = + 100% - 0%

Z5U Temperature Coefficient
50 VDC

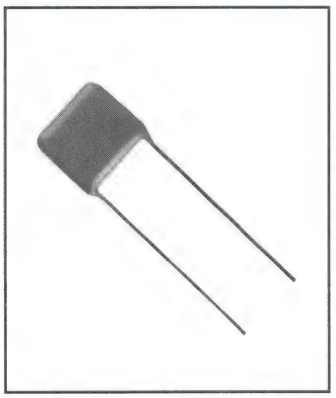
Capacity	Size (Inches) L	H	T	S	Catalog Number
4700 pF	.150	.210	.100	.100	M15U472*5
5600 pF	.150	.210	.100	.100	M15U562*5
6800 pF	.150	.210	.100	.100	M15U682*5
8200 pF	.150	.210	.100	.100	M15U822*5
.01 uF	.150	.210	.100	.100	M15U103*5
.012 uF	.150	.210	.100	.100	M15U123*5
.015 uF	.150	.210	.100	.100	M15U153*5
.018 uF	.150	.210	.100	.100	M15U183*5
.022 uF	.150	.210	.100	.100	M15U223*5
.027 uF	.150	.210	.100	.100	M15U273*5
.027 uF	.200	.260	.125	.100	M20U273*5
.027 uF	.200	.260	.125	.200	M22U273*5
.033 uF	.150	.210	.100	.100	M15U333*5
.033 uF	.200	.260	.125	.100	M20U333*5
.033 uF	.200	.260	.125	.200	M22U333*5
.039 uF	.150	.210	.100	.100	M15U393*5
.039 uF	.200	.260	.125	.100	M20U393*5
.039 uF	.200	.260	.125	.200	M22U393*5
.047 uF	.150	.210	.100	.100	M15U473*5
.047 uF	.200	.260	.125	.100	M20U473*5
.047 uF	.200	.260	.125	.200	M22U473*5
.056 uF	.150	.210	.100	.100	M15U563*5
.056 uF	.200	.260	.125	.100	M20U563*5
.056 uF	.200	.260	.125	.200	M22U563*5
.068 uF	.150	.210	.100	.100	M15U683*5
.068 uF	.200	.260	.125	.100	M20U683*5
.068 uF	.200	.260	.125	.200	M22U683*5
.082 uF	.200	.260	.125	.100	M20U823*5
.082 uF	.200	.260	.125	.200	M22U823*5
.1 uF	.150	.210	.100	.100	M15U104*5
.1 uF	.200	.260	.125	.100	M20U104*5
.1 uF	.200	.260	.125	.200	M22U104*5
.12 uF	.200	.260	.125	.100	M20U124*5
.12 uF	.200	.260	.125	.200	M22U124*5
.15 uF	.200	.260	.125	.100	M20U154*5
.15 uF	.200	.260	.125	.200	M22U154*5
.18 uF	.200	.260	.125	.100	M20U184*5
.18 uF	.200	.260	.125	.200	M22U184*5
.22 uF	.200	.260	.125	.100	M20U224*5
.22 uF	.200	.260	.125	.200	M22U224*5
.27 uF	.200	.260	.125	.100	M20U274*5
.27 uF	.200	.260	.125	.200	M22U274*5
.27 uF	.300	.360	.150	.200	M30U274*5
.33 uF	.200	.260	.125	.100	M20U334*5
.33 uF	.200	.260	.125	.200	M22U334*5
.33 uF	.300	.360	.150	.200	M30U334*5
.39 uF	.200	.260	.125	.100	M20U394*5
.39 uF	.200	.260	.125	.200	M22U394*5
.39 uF	.300	.360	.150	.200	M30U394*5
.47 uF	.200	.260	.125	.100	M20U474*5
.47 uF	.200	.260	.125	.200	M22U474*5
.47 uF	.300	.360	.150	.200	M30U474*5
.56 uF	.200	.260	.125	.100	M20U564*5
.56 uF	.200	.260	.125	.200	M22U564*5
.56 uF	.300	.360	.150	.200	M30U564*5
.68 uF	.300	.360	.150	.200	M30U684*5
.82 uF	.300	.360	.150	.200	M30U824*5
1.0 uF	.300	.360	.150	.200	M30U105*5
1.2 uF	.300	.360	.150	.200	M30U125*5
1.2 uF	.400	.460	.150	.200	M40U125*5
1.5 uF	.300	.360	.150	.200	M30U155*5
1.5 uF	.400	.460	.150	.200	M40U155*5
1.8 uF	.300	.360	.150	.200	M30U185*5
1.8 uF	.400	.460	.150	.200	M40U185*5
2.2 uF	.400	.460	.150	.200	M40U225*5
2.7 uF	.400	.460	.150	.200	M40U275*5
3.3 uF	.400	.460	.150	.200	M40U335*5
3.9 uF	.400	.460	.150	.200	M40U395*5
3.9 uF	.500	.560	.200	.400	M50U395*5
4.7 uF	.400	.460	.150	.200	M40U475*5
4.7 uF	.500	.560	.200	.400	M50U475*5
5.6 uF	.500	.560	.200	.400	M50U565*5
6.8 uF	.500	.560	.200	.400	M50U685*5

* Insert proper letter symbol for tolerance:
M = ±20%, Z = + 80% - 20%, P = + 100% - 0%

Add 'TR' to end of part number for Tape & Reel
M15, M20, M22 - 2,500 per reel
M30 - 1,500 per reel
M40 - 1,000 per reel
M50 - N/A
(Available in full reels only)

M60 Series
Multilayer Ceramic Capacitors

MALLORY



- Radial Leaded Conformally Coated
- Ultra High Insulation Resistance and Withstand Voltage
- Excellent Noise Suppression
- Applications : Ignition Noise Suppression for Automotive Application

GENERAL SPECIFICATIONS

Voltage Range:
25, 50, 100, 250 WVDC

Capacitance Range:
.1 μF to 100 μF

Capacitance Tolerance:
±20%

Temperature Coefficient:
Y5U

Operating Temperature:
-55°C to +125°C

Dissipation Factor:
2.5% Maximum

Insulation Resistance:
≥1000 Ω x μF or 10,000 MΩ. whichever is less

Withstand Voltage:
250% of rated voltage is applied for 1 to 5 seconds

Available in Tape and Ammo pack configuration:
Add 'TA' to end of catalog number

Maximum Ripple Current:

Length	.200	.248	.295	.394	.531	.886	1.12
Arms	0.3	0.8	1	1.5	2	3	4

Capacity µF	Volts	Temp Coeff	Size (Inches) L	H	T	S	d	Catalog Number
.68	25	Y5U	.200	.177	.138	.197	.020	M60UR68M25
1	25	Y5U	.200	.177	.138	.197	.020	M60U1M25
1.5	25	Y5U	.248	.197	.157	.197	.020	M60U1R5M25
2.2	25	Y5U	.248	.197	.157	.197	.020	M60U2R2M25
3.3	25	Y5U	.295	.295	.157	.197	.020	M60U3R3M25
4.7	25	Y5U	.295	.295	.157	.197	.020	M60U4R7M25
6.8	25	Y5U	.394	.394	.197	.197	.020	M60U6R8M25
10	25	Y5U	.394	.394	.197	.197	.020	M60U10M25
15	25	Y5U	.531	.531	.216	.394	.024	M60U15M25
22	25	Y5U	.531	.531	.216	.394	.024	M60U22M25
33	25	Y5U	.866	.689	.335	.787	.031	M60U33M25
47	25	Y5U	.866	.689	.335	.787	.031	M60U47M25
68	25	Y5U	1.120	.689	.335	.984	.031	M60U68M25
100	25	Y5U	1.120	.689	.335	.984	.031	M60U100M25
.1	50	Y5U	.200	.177	.138	.197	.020	M60UR10M50
.47	50	Y5U	.200	.177	.138	.197	.050	M60UR47M50
.68	50	Y5U	.248	.197	.157	.197	.020	M60UR68M50
1.0	50	Y5U	.248	.197	.157	.197	.020	M60U1M50
1.5	50	Y5U	.295	.295	.157	.197	.020	M60U1R5M50
3.3	50	Y5U	.295	.295	.157	.197	.020	M60U3R3M50
4.7	50	Y5U	.394	.394	.197	.197	.020	M60U4R7M50
6.8	50	Y5U	.394	.394	.197	.197	.020	M60U6R8M50
10	50	Y5U	.531	.531	.216	.394	.024	M60U10M50
15	50	Y5U	.531	.531	.216	.394	.024	M60U15M50
22	50	Y5U	.866	.689	.335	.787	.031	M60U22M50
33	50	Y5U	.866	.689	.335	.787	.031	M60U33M50
47	50	Y5U	1.120	.689	.335	.984	.031	M60U47M50
68	50	Y5U	1.120	.689	.335	.984	.031	M60U68M50

Capacity µF	Volts	Temp Coeff	Size (Inches) L	H	T	S	d	Catalog Number
.1	100	Y5U	.200	.177	.138	.197	.020	M60UR10M100
.15	100	Y5U	.200	.177	.138	.197	.020	M60UR15M100
.22	100	Y5U	.200	.177	.138	.197	.020	M60UR22M100
.33	100	Y5U	.248	.197	.157	.197	.020	M60UR33M100
.47	100	Y5U	.248	.197	.157	.197	.020	M60UR47M100
.68	100	Y5U	.295	.295	.157	.197	.020	M60UR68M100
1.0	100	Y5U	.295	.295	.157	.197	.020	M60U1M100
1.5	100	Y5U	.295	.295	.157	.197	.020	M60U1R5M100
2.2	100	Y5U	.394	.394	.197	.197	.020	M60U2R2M100
3.3	100	Y5U	.394	.394	.197	.197	.020	M60U3R3M100
4.7	100	Y5U	.531	.531	.216	.394	.024	M60U4R7M100
6.8	100	Y5U	.531	.531	.216	.394	.024	M60U6R8M100
10	100	Y5U	.866	.689	.335	.787	.031	M60U10M100
15	100	Y5U	.866	.689	.335	.787	.031	M60U15M100
22	100	Y5U	1.120	.689	.335	.984	.031	M60U22M100
33	100	Y5U	1.120	.689	.335	.984	.031	M60U33M100
.1	250	Y5U	.248	.197	.157	.197	.020	M60UR10M250
.15	250	Y5U	.248	.197	.157	.197	.020	M60UR15M250
.22	250	Y5U	.295	.295	.157	.197	.020	M60UR22M250
.33	250	Y5U	.295	.295	.157	.197	.020	M60UR33M250
.47	250	Y5U	.394	.394	.197	.197	.020	M60UR47M250
.68	250	Y5U	.394	.394	.197	.197	.020	M60UR68M250
1	250	Y5U	.531	.531	.216	.394	.024	M60U1M250
1.5	250	Y5U	.531	.531	.216	.394	.024	M60U1R5M250
2.2	250	Y5U	.866	.689	.335	.787	.031	M60U2R2M250
3.3	250	Y5U	.866	.689	.335	.787	.031	M60U3R3M250
4.7	250	Y5U	1.120	.689	.335	.984	.031	M60U4R7M250
6.8	250	Y5U	1.120	.689	.335	.984	.031	M60U6R8M250

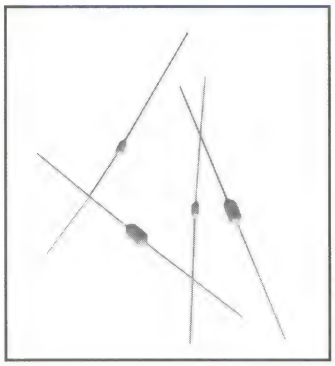
Add 'TA' to end of part number for lead taping.
Available in Ammo Pack only. (Full boxes only)

LENGTH	QUANTITY PER BOX
.200	2,000 pcs
.248	2,000 pcs
.394	1,500 pcs

Not available in larger sizes

P10 to P40 Series
Multilayer Ceramic Capacitors

MALLORY



- Axial Leaded
  Conformally Coated
- Encapsulation consists of a moisture and shock resistant coating that meets UL94V-0
- Over 138 CV values available
- Applications:
  Filtering, Bypass, Coupling
- IECQ Approved to:
  QC300601/US0001 - NPO
  QC300701/US0003 - X7R
  QC300701/US0001 - Z5U

GENERAL SPECIFICATIONS

Voltage Range:
50, 100, 200 VDC

Capacitance Range:
10 pF to 1.0 μF

Temperature Coefficients:
COG(NPO), X7R, Z5U

Available in Tape and Reel configuration:
Add 'TR' to end of catalog number

COG (NPO) Temperature Coefficient 200 VDC

Capacity	Size (Inches) D	L	Catalog Number
10 pF	.100	.170	P10G100*2
12 pF	.100	.170	P10G120*2
15 pF	.100	.170	P10G150*2
18 pF	.100	.170	P10G180*2
22 pF	.100	.170	P10G220*2
33 pF	.100	.170	P10G330*2
39 pF	.100	.170	P10G390*2
47 pF	.100	.170	P10G470*2
56 pF	.100	.170	P10G560*2

Capacity	Size (Inches) D	L	Catalog Number
68 pF	.100	.170	P10G680*2
82 pF	.100	.170	P10G820*2
100 pF	.100	.170	P10G101*2
120 pF	.100	.170	P10G121*2
150 pF	.100	.170	P10G151*2
180 pF	.100	.170	P10G181*2
220 pF	.100	.170	P10G221*2
270 pF	.100	.170	P10G271*2

* Insert proper letter symbol for tolerance: J = ±5%, K = ± 10%

COG (NPO) Temperature Coefficient 100 VDC

Capacity	Size (Inches) D	L	Catalog Number
10 pF	.100	.170	P10G100*1
12 pF	.100	.170	P10G120*1
15 pF	.100	.170	P10G150*1
18 pF	.100	.170	P10G180*1
22 pF	.100	.170	P10G220*1
27 pF	.100	.170	P10G270*1
33 pF	.100	.170	P10G330*1
39 pF	.100	.170	P10G390*1
47 pF	.100	.170	P10G470*1
56 pF	.100	.170	P10G560*1
68 pF	.100	.170	P10G680*1
82 pF	.100	.170	P10G820*1
100 pF	.100	.170	P10G101*1

Capacity	Size (Inches) D	L	Catalog Number
120 pF	.100	.170	P10G121*1
150 pF	.100	.170	P10G151*1
180 pF	.100	.170	P10G181*1
220 pF	.100	.170	P10G221*1
270 pF	.100	.170	P10G271*1
330 pF	.100	.170	P10G331*1
390 pF	.100	.170	P10G391*1
470 pF	.100	.170	P10G471*1
560 pF	.100	.170	P10G561*1
680 pF	.100	.170	P10G681*1
820 pF	.100	.170	P10G821*1
1000 pF	.100	.170	P10G102*1
1200 pF	.100	.260	P20G122*1

Capacity	Size (Inches) D	L	Catalog Number
1500 pF	.100	.260	P20G152*1
1800 pF	.100	.260	P20G182*1
2200 pF	.100	.260	P20G222*1
2700 pF	.150	.290	P30G272*1
3300 pF	.150	.290	P30G332*1
3900 pF	.150	.290	P30G392*1
4700 pF	.150	.290	P30G472*1
5600 pF	.150	.290	P30G562*1
6800 pF	.150	.290	P30G682*1
8200 pF	.150	.290	P30G822*1
.01 uF	.150	.400	P40G103*1
.012 uF	.150	.400	P40G123*1
.015 uF	.150	.400	P40G153*1

* Insert proper letter symbol for tolerance: J = ±5%, K = ± 10%

COG (NPO) Temperature Coefficient 50 VDC

Capacity	Size (Inches) D	L	Catalog Number
560 pF	.100	.170	P10G561*5
680 pF	.100	.170	P10G681*5
820 pF	.100	.170	P10G821*5
1000 pF	.100	.170	P10G102*5
1200 pF	.120	.170	P12G122*5
1200 pF	.100	.260	P20G122*5
1500 pF	.120	.170	P12G152*5
1500 pF	.100	.260	P20G152*5

Capacity	Size (Inches) D	L	Catalog Number
1800 pF	.120	.170	P12G182*5
1800 pF	.100	.260	P20G182*5
2200 pF	.120	.170	P12G222*5
2200 pF	.100	.260	P20G222*5
2700 pF	.120	.170	P12G272*5
2700 pF	.150	.290	P30G272*5
3300 pF	.150	.290	P30G332*5
3900 pF	.150	.290	P30G392*5

Capacity	Size (Inches) D	L	Catalog Number
4700 pF	.150	.290	P30G472*5
5600 pF	.150	.290	P30G562*5
6800 pF	.150	.290	P30G682*5
8200 pF	.150	.290	P30G822*5
.01 uF	.150	.400	P40G103*5
.012 uF	.150	.400	P40G123*5
.015 uF	.150	.400	P40G153*5

* Insert proper letter symbol for tolerance:
J = ±5%, K = ± 10%

Add 'TR' to end of part number for Tape & Reel
P10, P12, P20 - 5,000 per reel
P30, P40 - 2,500 per reel
(Available in full reels only)

P10 to P40 Series
Multilayer Ceramic Capacitors

MALLORY

X7R Temperature Coefficient
100 VDC

Capacity	Size (Inches) D	L	Catalog Number
470 pF	.100	.170	P10R471*1
560 pF	.100	.170	P10R561*1
680 pF	.100	.170	P10R681*1
820 pF	.100	.170	P10R821*1
1000 pF	.100	.170	P10R102*1
1200 pF	.100	.170	P10R122*1
1500 pF	.100	.170	P10R152*1
1800 pF	.100	.170	P10R182*1
2200 pF	.100	.170	P10R222*1
2700 pF	.100	.170	P10R272*1
3300 pF	.100	.170	P10R332*1
3900 pF	.100	.170	P10R392*1
4700 pF	.100	.170	P10R472*1
5600 pF	.100	.170	P10R562*1
6800 pF	.100	.170	P10R682*1
8200 pF	.100	.170	P10R822*1
.01 uF	.100	.170	P10R103*1
.012 uF	.100	.170	P10R123*1
.015 uF	.120	.170	P12R153*1
.015 uF	.100	.260	P20R153*1
.018 uF	.120	.170	P12R183*1
.018 uF	.100	.260	P20R183*1
.022 uF	.120	.170	P12R223*1
.022 uF	.100	.260	P20R223*1
.027 uF	.120	.170	P12R273*1
.027 uF	.100	.260	P20R273*1
.033 uF	.100	.260	P20R333*1
.039 uF	.150	.290	P30R393*1
.047 uF	.150	.290	P30R473*1
.056 uF	.150	.290	P30R563*1
.068 uF	.150	.290	P30R683*1
.082 uF	.150	.290	P30R823*1
.1 uF	.150	.290	P30R104*1
.12 uF	.150	.290	P40R124*1
.15 uF	.150	.400	P40R154*1

Also available in 200VDC, If ordering 200VDC replace the 1 at end of part number with a 2.

* Insert proper letter symbol for tolerance: K = ±10%, M = ±20%

X7R Temperature Coefficient
50 VDC

Capacity	Size (Inches) D	L	Catalog Number
8200 pF	.100	.170	P10R822*5
.01 uF	.100	.170	P10R103*5
.012 uF	.100	.170	P10R123*5
.015 uF	.100	.170	P10R153*5
.018 uF	.100	.170	P10R183*5
.022 uF	.100	.170	P10R223*5
.027 uF	.100	.170	P10R273*5
.033 uF	.100	.170	P10R333*5
.039 uF	.100	.170	P10R393*5
.047 uF	.100	.170	P10R473*5
.056 uF	.120	.170	P12R563*5
.056 uF	.100	.260	P20R563*5
.068 uF	.120	.170	P12R683*5
.068 uF	.100	.260	P20R683*5
.082 uF	.120	.170	P12R823*5
.082 uF	.100	.260	P20R823*5
.1 uF	.120	.170	P12R104*5
.1 uF	.100	.260	P20R104*5
.12 uF	.150	.290	P30R124*5
.15 uF	.150	.290	P30R154*5
.18 uF	.150	.290	P30R184*5
.22 uF	.150	.290	P30R224*5
.27 uF	.150	.290	P30R274*5
.33 uF	.150	.400	P40R334*5
.39uF	.150	.400	P40R394*5
.47uF	.150	.400	P40R474*5

* Insert proper letter symbol for tolerance: K = ±10%, M = ±20%

Z5U Temperature Coefficient
100 VDC

Capacity	Size (Inches) D	L	Catalog Number
.01 uF	.100	.170	P10U103*1
.012 uF	.100	.170	P10U123*1
.015 uF	.100	.170	P10U153*1
.018 uF	.100	.170	P10U183*1
.022 uF	.100	.170	P10U223*1
.027 uF	.100	.260	P20U273*1
.033 uF	.100	.260	P20U333*1
.039 uF	.100	.260	P20U393*1
.047 uF	.100	.260	P20U473*1
.056 uF	.150	.290	P30U563*1
.068 uF	.150	.290	P30U683*1
.082 uF	.150	.290	P30U823*1
.1 uF	.150	.290	P30U104*1
.12 uF	.150	.290	P30U124*1
.15 uF	.150	.290	P30U154*1
.18 uF	.150	.400	P40U184*1
.22 uF	.150	.400	P40U224*1

* Insert proper letter symbol for tolerance: M = ±20%, Z = + 80 - 20%, P = + 100 - 0%

Z5U Temperature Coefficient
50 VDC

Capacity	Size (Inches) D	L	Catalog Number
.027 uF	0.100	0.170	P10U273*5
.033 uF	0.100	0.170	P10U333*5
.039 uF	0.100	0.170	P10U393*5
.047 uF	0.100	0.170	P10U473*5
.056 uF	0.100	0.170	P10U563*5
.068 uF	0.100	0.170	P10U683*5
.082 uF	0.100	0.170	P10U823*5
.1 uF	0.100	0.170	P10U104*5
.12 uF	0.100	0.170	P10U124*5
.12 uF	0.100	0.260	P20U124*5
.15 uF	0.100	0.170	P10U154*5
.18 uF	0.100	0.170	P10U184*5
.22 uF	0.100	0.170	P10U224*5
.27 uF	0.120	0.170	P12U274*5
.27 uF	0.100	0.260	P20U274*5
.33 uF	0.120	0.170	P12U334*5
.33 uF	0.100	0.260	P20U334*5
.39 uF	0.150	0.290	P30U394*5
.47 uF	0.150	0.290	P30U474*5
.56 uF	0.150	0.400	P40U564*5
.68 uF	0.150	0.400	P40U684*5
.82 uF	0.150	0.400	P40U824*5
1.0 uF	0.150	0.400	P40U105*5

Add 'TR' to end of part number for Tape & Reel
P10, P12, P20 - 5,000 per reel
P30, P40 - 2,500 per reel
(Available in full reels only)

* Insert proper letter symbol for tolerance:
M = ±20%, Z = + 80 - 20%, P = + 100 - 0%

MIL-C-11015 & 39014
Multilayer Ceramic Capacitors

MALLORY

- Radial and Axial Leaded
- Molded Case Construction
- Stand-off Version Available in Radial Leaded CKR Type
- Hot Solder Dipped Leads in CKR Type

GENERAL SPECIFICATIONS

Voltage Range:
50, 100, 200 VDC

Capacitance Range:
10 pF to 3.3 μF

Temperature Coefficient:
X7R (Mil BX or BR)

Available in Tape and Reel configuration: Add 'TR' to end of catalog number. For quantity information see box at bottom of each series.

200 WVDC - Radial Leaded - CK05/M39014/01

Cap	Tol %	MIL-C-11015/18	MIL-C-39014/01 Reference	39014/01 Failure Rate Levels M	P	R	S
10 pF	10	CK05BX100K	CKR05BX100K*	1201	1241	1281	1321
10 pF	20	CK05BX100M	CKR05BX100M*	1202	1242	1282	1322
12 pF	10	CK05BX120K	CKR05BX120K*	1203	1243	1283	1323
15 pF	10	CK05BX150K	CKR05BX150K*	1204	1244	1284	1324
15 pF	20	CK05BX150M	CKR05BX150M*	1205	1245	1285	1325
18 pF	10	CK05BX180K	CKR05BX180K*	1206	1246	1286	1326
22 pF	10	CK05BX220K	CKR05BX220K*	1207	1247	1287	1327
22 pF	20	CK05BX220M	CKR05BX220M*	1208	1248	1288	1328
27 pF	10	CK05BX270K	CKR05BX270K*	1209	1249	1289	1329
33 pF	10	CK05BX330K	CKR05BX330K*	1210	1250	1290	1330
33 pF	20	CK05BX330M	CKR05BX330M*	1211	1251	1291	1331
39 pF	10	CK05BX390K	CKR05BX390K*	1212	1252	1292	1332
47 pF	10	CK05BX470K	CKR05BX470K*	1213	1253	1293	1333
47 pF	20	CK05BX470M	CKR05BX470M*	1214	1254	1294	1334
56 pF	10	CK05BX560K	CKR05BX560K*	1215	1255	1295	1335
68 pF	10	CK05BX680K	CKR05BX680K*	1216	1256	1296	1336
68 pF	20	CK05BX680M	CKR05BX680M*	1217	1257	1297	1337
82 pF	10	CK05BX820K	CKR05BX820K*	1218	1258	1298	1338
100 pF	10	CK05BX101K	CKR05BX101K*	1219	1259	1299	1339
100 pF	20	CK05BX101M	CKR05BX101M*	1220	1260	1300	1340
120 pF	10	CK05BX121K	CKR05BX121K*	1221	1261	1301	1341
150 pF	10	CK05BX151K	CKR05BX151K*	1222	1262	1302	1342
150 pF	20	CK05BX151M	CKR05BX151M*	1223	1263	1303	1343
180 pF	10	CK05BX181K	CKR05BX181K*	1224	1264	1304	1344
220 pF	10	CK05BX221K	CKR05BX221K*	1225	1265	1305	1345
220 pF	20	CK05BX221M	CKR05BX221M*	1226	1266	1306	1346
270 pF	10	CK05BX271K	CKR05BX271K*	1227	1267	1307	1347
330 pF	10	CK05BX331K	CKR05BX331K*	1228	1268	1308	1348
330 pF	20	CK05BX331M	CKR05BX331M*	1229	1269	1309	1349
390 pF	10	CK05BX391K	CKR05BX391K*	1230	1270	1310	1350
470 pF	10	CK05BX471K	CKR05BX471K*	1231	1271	1311	1351
470 pF	20	CK05BX471M	CKR05BX471M*	1232	1272	1312	1352
560 pF	10	CK05BX561K	CKR05BX561K*	1233	1273	1313	1353
680 pF	10	CK05BX681K	CKR05BX681K*	1234	1274	1314	1354
680 pF	20	CK05BX681M	CKR05BX681M*	1235	1275	1315	1355
820 pF	10	CK05BX821K	CKR05BX821K*	1236	1276	1316	1356
1000 pF	10	CK05BX102K	CKR05BX102K*	1237	1277	1317	1357
1000 pF	20	CK05BX102M	CKR05BX102M*	1238	1278	1318	1358

100 WVDC - Radial Leaded - CK05/M39014/01

Cap	Tol %	MIL-C-11015/18	MIL-C-39014/01 Reference	39014/01 Failure Rate Levels M	P	R	S
1200 pF	10	CK05BX122K	CKR05BX122K*	1239	1279	1319	1359
1500 pF	10	CK05BX152K	CKR05BX152K*	1240	1280	1320	1360
1500 pF	20	CK05BX152M	CKR05BX152M*	1441	1481	1521	1561
1800 pF	10	CK05BX182K	CKR05BX182K*	1442	1482	1522	1562
2200 pF	10	CK05BX222K	CKR05BX222K*	1443	1483	1523	1563
2200 pF	20	CK05BX222M	CKR05BX222M*	1444	1484	1524	1564
2700 pF	10	CK05BX272K	CKR05BX272K*	1445	1485	1525	1565
3300 pF	10	CK05BX332K	CKR05BX332K*	1446	1486	1526	1566
3300 pF	20	CK05BX332M	CKR05BX332M*	1447	1487	1527	1567
3900 pF	10	CK05BX392K	CKR05BX392K*	1448	1488	1528	1568
4700 pF	10	CK05BX472K	CKR05BX472K*	1449	1489	1529	1569
4700 pF	20	CK05BX472M	CKR05BX472M*	1450	1490	1530	1570
5600 pF	10	CK05BX562K	CKR05BX562K*	1451	1491	1531	1571
6800 pF	10	CK05BX682K	CKR05BX682K*	1452	1492	1532	1572
6800 pF	20	CK05BX682M	CKR05BX682M*	1453	1493	1533	1573
8200 pF	10	CK05BX822K	CKR05BX822K*	1454	1494	1534	1574
.01 uF	10	CK05BX103K	CKR05BX103K*	1455	1495	1535	1575
.01 uF	20	CK05BX103M	CKR05BX103M*	1456	1496	1536	1576

50 WVDC - Radial Leaded - CK05/M39014/01

Cap	Tol %	MIL-C-11015/18	MIL-C-39014/01 Reference	39014/01 Failure Rate Levels M	P	R	S
.012 uF	10	CK05BX123K	CKR05BX123K*	1457	1497	1537	1577
.015 uF	10	CK05BX153K	CKR05BX153K*	1458	1498	1538	1578
.015 uF	20	CK05BX153M	CKR05BX153M*	1459	1499	1539	1579
.018 uF	10	CK05BX183K	CKR05BX183K*	1460	1500	1540	1580
.022 uF	10	CK05BX223K	CKR05BX223K*	1461	1501	1541	1581
.022 uF	20	CK05BX223M	CKR05BX223M*	1462	1502	1542	1582
.027 uF	10	CK05BX273K	CKR05BX273K*	1463	1503	1543	1583
.033 uF	10	CK05BX333K	CKR05BX333K*	1464	1504	1544	1584
.033 uF	20	CK05BX333M	CKR05BX333M*	1465	1505	1545	1585
.039 uF	10	CK05BX393K	CKR05BX393K*	1466	1506	1546	1586
.047 uF	10	CK05BX473K	CKR05BX473K*	1467	1507	1547	1587
.047 uF	20	CK05BX473M	CKR05BX473M*	1468	1508	1548	1588
.056 uF	10	CK05BX563K	CKR05BX563K*	1469	1509	1549	1589
.068 uF	10	CK05BX683K	CKR05BX683K*	1470	1510	1550	1590
.068 uF	20	CK05BX683M	CKR05BX683M*	1471	1511	1551	1591
.082 uF	10	CK05BX823K	CKR05BX823K*	1472	1512	1552	1592
.1 uF	10	CK05BX104K	CKR05BX104K*	1473	1513	1553	1593
.1 uF	20	CK05BX104M	CKR05BX104M*	1474	1514	1554	1594

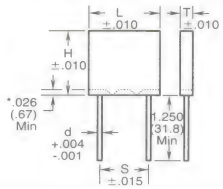
* Insert proper letter symbol for Failure Rate Designator:
M = 1% / 1000 Hours, P = 0.1% / 1000 Hours
R = 0.01% / 1000 Hours, S = 0.001% / 1000 Hours

Add 'V' at end of failure rate designator if stand-off design is required. (CKR only)

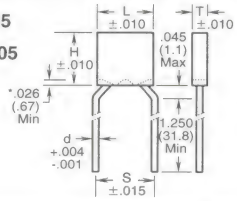
Part	Inches					mm				
	L	H	T	S	d	L	H	T	S	d
CK05	.190	.190	.090	.200	.025	4.8	4.8	2.3	5.1	.64
CKR05	.190	.190	.090	.200	.025	4.8	4.8	2.3	5.1	.64
CK06	.290	.290	.090	.200	.025	7.4	7.4	2.3	5.1	.64
CKR06	.290	.290	.090	.200	.025	7.4	7.4	2.3	5.1	.64

Add 'TR' to end of part number for Tape & Reel
Leads will be trimmed to .625" length
CK05 - 2,000 per reel
CKR05 - 1,700 per reel
(Available in full reels only)

CK06
CKR06



CK05
CKR05



TO ORDER MIL-C-11015 PARTS:

Order by CK part number shown above.
Example: CK05BX104M

TO ORDER MIL-C-39014 PARTS:

Indicate the prefix M39014/-- followed by the applicable MIL dash number. Example: For M39014/01-1594 (CKR05BX104MS); order M39014/011594

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

MIL-C-11015 & 39014
Multilayer Ceramic Capacitors

MALLORY

200 WVDC - Radial Leaded - CK06/M39014/02

Cap	Tol %	MIL-C-11015/19	MIL-C-39014/02 Reference	39014/02 Failure Rate Levels M	P	R	S
1200 pF	10	CK06BX122K	CKR06BX122K*	1201	1241	1281	1321
1500 pF	10	CK06BX152K	CKR06BX152K*	1202	1242	1282	1322
1500 pF	20	CK06BX152M	CKR06BX152M*	1203	1243	1283	1323
1800 pF	10	CK06BX182K	CKR06BX182K*	1204	1244	1284	1324
2200 pF	10	CK06BX222K	CKR06BX222K*	1206	1246	1286	1326
2200 pF	20	CK06BX222M	CKR06BX222M*	1207	1247	1287	1327
2700 pF	10	CK06BX272K	CKR06BX272K*	1208	1248	1288	1328
3300 pF	10	CK06BX332K	CKR06BX332K*	1209	1249	1289	1329
3300 pF	20	CK06BX332M	CKR06BX332M*	1210	1250	1290	1330
3900 pF	10	CK06BX392K	CKR06BX392K*	1211	1251	1291	1331
4700 pF	10	CK06BX472K	CKR06BX472K*	1212	1252	1292	1332
4700 pF	20	CK06BX472M	CKR06BX472M*	1213	1253	1293	1333
5600 pF	10	CK06BX562K	CKR06BX562K*	1214	1254	1294	1334
6800 pF	10	CK06BX682K	CKR06BX682K*	1215	1255	1295	1335
6800 pF	20	CK06BX682M	CKR06BX682M*	1216	1256	1296	1336
8200 pF	10	CK06BX822K	CKR06BX822K*	1217	1257	1297	1337
.01 uF	10	CK06BX103K	CKR06BX103K*	1218	1258	1298	1338
.01 uF	20	CK06BX103M	CKR06BX103M*	1219	1259	1299	1339

100 WVDC - Radial Leaded - CK06/M39014/02

Cap	Tol %	MIL-C-11015/19	MIL-C-39014/02 Reference	39014/02 Failure Rate Levels M	P	R	S
.012 uF	10	CK06BX123K	CKR06BX123K*	1231	1271	1311	1351
.015 uF	10	CK06BX153K	CKR06BX153K*	1220	1260	1300	1340
.015 uF	20	CK06BX153M					
.018 uF	10	CK06BX183K	CKR06BX183K*	1221	1261	1301	1341
.022 uF	10	CK06BX223K	CKR06BX223K*	1222	1262	1302	1342
.022 uF	20	CK06BX223M					
.027 uF	10	CK06BX273K	CKR06BX273K*	1232	1272	1312	1352
.033 uF	10	CK06BX333K	CKR06BX333K*	1223	1263	1303	1343
.033 uF	20	CK06BX333M					
.039 uF	10	CK06BX393K	CKR06BX393K*	1224	1264	1304	1344

Add 'TR' to end of part number for Tape & Reel
Leads will be trimmed to .625" length
CK06 - 1,500 per reel
CKR06 - 1,500 per reel
(Available in full reels only)

100 WVDC - Radial Leaded - CK06/M39014/02

Cap	Tol %	MIL-C-11015/19	MIL-C-39014/02 Reference	39014/02 Failure Rate Levels M	P	R	S
.047 uF	10	CK06BX473K	CKR06BX473K*	1225	1265	1305	1345
.047 uF	20	CK06BX473M					
.056 uF	10	CK06BX563K	CKR06BX563K*	1226	1266	1306	1346
.068 uF	10	CK06BX683K	CKR06BX683K*	1227	1267	1307	1347
.068 uF	20	CK06BX683M					
.082 uF	10	CK06BX823K	CKR06BX823K*	1229	1269	1309	1349
.1 uF	10	CK06BX104K	CKR06BX104K*	1230	1270	1310	1350
.1 uF	20	CK06BX104M					

50 WVDC - Radial Leaded - CK06/M39014/02

Cap	Tol %	MIL-C-11015/19	MIL-C-39014/02 Reference	39014/02 Failure Rate Levels M	P	R	S
.12 uF	10	CK06BX124K	CKR06BX124K*	1233	1273	1313	1353
.15 uF	10	CK06BX154K	CKR06BX154K*	1234	1274	1314	1354
.15 uF	20	CK06BX154M					
.18 uF	10	CK06BX184K	CKR06BX184K*	1235	1275	1315	1355
.22 uF	10	CK06BX224K	CKR06BX224K*	1236	1276	1316	1356
.22 uF	20	CK06BX224M					
.27 uF	10	CK06BX274K	CKR06BX274K*	1237	1277	1317	1357
.33 uF	10	CK06BX334K	CKR06BX334K*	1238	1278	1318	1358
.33 uF	20	CK06BX334M					
.39 uF	10	CK06BX394K	CKR06BX394K*	1239	1279	1319	1359
.47 uF	10	CK06BX474K	CKR06BX474K*	1240	1280	1320	1360
.47 uF	20	CK06BX474M					
.56 uF	10	CK06BX564K	CKR06BX564K*	1404	1408	1412	1416
.68 uF	10	CK06BX684K	CKR06BX684K*	1405	1409	1413	1417
.68 uF	20	CK06BX684M					
.82 uF	10	CK06BX824K	CKR06BX824K*	1406	1410	1414	1418
1.0 uF	10	CK06BX105K	CKR06BX105K*	1407	1411	1415	1419
1.0 uF	20	CK06BX105M					

* Insert proper letter symbol for Failure Rate Designator:
M = 1% / 1000 Hours, P = 0.1% / 1000 Hours,
R = 0.01% / 1000 Hours, S = 0.001% / 1000 Hours

Add 'V' at end of failure rate designator if stand-off design is required. (CKR only)

100 WVDC - Axial Leaded - CK12/M39014/05

Cap	Tol %	MIL-C-11015/20	MIL-C-39014/05 Reference	39014/05 Failure Rate Levels M	P	R	S
10 pF	10	CK12BX100K	CKR11BX100K*	2601	2801	2001	2201
10 pF	20	CK12BX100M	CKR11BX100M*	2602	2802	2002	2202
12 pF	10	CK12BX120K	CKR11BX120K*	2603	2803	2003	2203
15 pF	10	CK12BX150K	CKR11BX150K*	2604	2804	2004	2204
15 pF	20	CK12BX150M	CKR11BX150M*	2605	2805	2005	2205
18 pF	10	CK12BX180K	CKR11BX180K*	2606	2806	2006	2206
22 pF	10	CK12BX220K	CKR11BX220K*	2607	2807	2007	2207
22 pF	20	CK12BX220M	CKR11BX220M*	2608	2808	2008	2208
27 pF	10	CK12BX270K	CKR11BX270K*	2609	2809	2009	2209
33 pF	10	CK12BX330K	CKR11BX330K*	2610	2810	2010	2210
33 pF	20	CK12BX330M	CKR11BX330M*	2611	2811	2011	2211
39 pF	10	CK12BX390K	CKR11BX390K*	2612	2812	2012	2212
47 pF	10	CK12BX470K	CKR11BX470K*	2613	2813	2013	2213
47 pF	20	CK12BX470M	CKR11BX470M*	2614	2814	2014	2214
56 pF	10	CK12BX560K	CKR11BX560K*	2615	2815	2015	2215
68 pF	10	CK12BX680K	CKR11BX680K*	2616	2816	2016	2216
68 pF	20	CK12BX680M	CKR11BX680M*	2617	2817	2017	2217
82 pF	10	CK12BX820K	CKR11BX820K*	2618	2818	2018	2218
100 pF	10	CK12BX101K	CKR11BX101K*	2619	2819	2019	2219
100 pF	20	CK12BX101M	CKR11BX101M*	2620	2820	2020	2220
120 pF	10	CK12BX121K	CKR11BX121K*	2621	2821	2021	2221
150 pF	10	CK12BX151K	CKR11BX151K*	2622	2822	2022	2222
150 pF	20	CK12BX151M	CKR11BX151M*	2623	2823	2023	2223
180 pF	10	CK12BX181K	CKR11BX181K*	2624	2824	2024	2224
220 pF	10	CK12BX221K	CKR11BX221K*	2625	2825	2025	2225
220 pF	20	CK12BX221M	CKR11BX221M*	2626	2826	2026	2226
270 pF	10	CK12BX271K	CKR11BX271K*	2627	2827	2027	2227
330 pF	10	CK12BX331K	CKR11BX331K*	2628	2828	2028	2228
330 pF	20	CK12BX331M	CKR11BX331M*	2629	2829	2029	2229
390 pF	10	CK12BX391K	CKR11BX391K*	2630	2830	2030	2230

Add 'TR to end of part number for Tape & Reel
CK12 - 5,000 per reel
CKR11 - 5,000 per reel
(Available in full reels only)

100 WVDC - Axial Leaded - CK12/M39014/05

Cap	Tol %	MIL-C-11015/20	MIL-C-39014/05 Reference	39014/05 Failure Rate Levels M	P	R	S
470 pF	10	CK12BX471K	CKR11BX471K*	2631	2831	2031	2231
470 pF	20	CK12BX471M	CKR11BX471M*	2632	2832	2032	2232
560 pF	10	CK12BX561K	CKR11BX561K*	2633	2833	2033	2233
680 pF	10	CK12BX681K	CKR11BX681K*	2634	2834	2034	2234
680 pF	20	CK12BX681M	CKR11BX681M*	2635	2835	2035	2235
820 pF	10	CK12BX821K	CKR11BX821K*	2636	2836	2036	2236
1000 pF	10	CK12BX102K	CKR11BX102K*	2637	2837	2037	2237
1000 pF	20	CK12BX102M	CKR11BX102M*	2638	2838	2038	2238
1200 pF	10	CK12BX122K	CKR11BX122K*	2639	2839	2039	2239
1500 pF	10	CK12BX152K	CKR11BX152K*	2640	2840	2040	2240
1500 pF	20	CK12BX152M	CKR11BX152M*	2641	2841	2041	2241
1800 pF	10	CK12BX182K	CKR11BX182K*	2642	2842	2042	2242
2200 pF	10	CK12BX222K	CKR11BX222K*	2643	2843	2043	2243
2200 pF	20	CK12BX222M	CKR11BX222M*	2644	2844	2044	2244
2700 pF	10	CK12BX272K	CKR11BX272K*	2645	2845	2045	2245
3300 pF	10	CK12BX332K	CKR11BX332K*	2646	2846	2046	2246
3300 pF	20	CK12BX332M	CKR11BX332M*	2647	2847	2047	2247
3900 pF	10	CK12BX392K	CKR11BX392K*	2648	2848	2048	2248
4700 pF	10	CK12BX472K	CKR11BX472K*	2649	2849	2049	2249
4700 pF	20	CK12BX472M	CKR11BX472M*	2650	1850	2050	2250

50 WVDC - Axial Leaded - CK12/M39014/05

Cap	Tol %	MIL-C-11015/20	MIL-C-39014/05 Reference	39014/05 Failure Rate Levels M	P	R	S
5600 pF	10	CK12BX562K	CKR11BX562K*	2651	2851	2051	2251
6800 pF	10	CK12BX682K	CKR11BX682K*	2652	2852	2052	2252
6800 pF	20	CK12BX682M	CKR11BX682M*	2653	2853	2053	2253
8200 pF	10	CK12BX822K	CKR11BX822K*	2654	2854	2054	2254
0.01 uF	10	CK12BX103K	CKR11BX103K*	2655	2855	2055	2255
0.01 uF	20	CK12BX103M	CKR11BX103M*	2656	2856	2056	2256

* Insert proper letter symbol for Failure Rate Designator:
M = 1% / 1000 Hours, P = 0.1% / 1000 Hours,
R = 0.01% / 1000 Hours, S = 0.001% / 1000 Hours

MIL-C-11015 & 39014
Multilayer Ceramic Capacitors

MALLORY

Cap	Tol %	MIL-C-11015/19	MIL-C-39014/05 Reference	39014/05 Failure Rate Levels M	P	R	S
100 WVDC - Axial Leaded - CK13/M39014/05							
5600 pF	10	CK13BX562K	CKR12BX562K*	2657	2857	2057	2257
6800 pF	10	CK13BX682K	CKR12BX682K*	2658	2858	2058	2258
6800 pF	20	CK13BX682M	CKR12BX682M*	2659	2859	2059	2259
8200 pF	10	CK13BX822K	CKR12BX822K*	2660	2860	2060	2260
.01 uF	10	CK13BX103K	CKR12BX103K*	2661	2861	2061	2261
.01 uF	20	CK13BX103M	CKR12BX103M*	2662	2862	2062	2262
50 WVDC - Axial Leaded - CK13/M39014/05							
.012 uF	10	CK13BX123K	CKR12BX123K*	2663	2863	2063	2263
.015 uF	10	CK13BX153K	CKR12BX153K*	2664	2864	2064	2264
.015 uF	20	CK13BX153M	CKR12BX153M*	2665	2865	2065	2265
.018 uF	10	CK13BX183K	CKR12BX183K*	2666	2866	2066	2266
.022 uF	10	CK13BX223K	CKR12BX223K*	2667	2867	2067	2267
.022 uF	20	CK13BX223M	CKR12BX223M*	2668	2868	2068	2268
.027 uF	10	CK13BR273K	CKR12BX273K*	2669	2869	2069	2269
.033 uF	10	CK13BR333K	CKR12BX333K*	2670	2870	2070	2270
.033 uF	20	CK13BR333M	CKR12BX333M*	2671	2871	2071	2271
.039 uF	10	CK13BR393K	CKR12BX393K*	2672	2872	2072	2272
.047 uF	10	CK13BR473K	CKR12BX473K*	2673	2873	2073	2273
.047 uF	20	CK13BR473M	CKR12BX473M*	2674	2874	2074	2274

Cap	Tol %	MIL-C-11015/19	MIL-C-39014/05 Reference	39014/05 Failure Rate Levels M	P	R	S
100 WVDC - Axial Leaded - CK15/M39014/05							
.056 uF	10		CKR15BX563K*	2706	2906	2106	2306
.068 uF	10		CKR15BX683K*	2707	2907	2107	2307
.068 uF	20		CKR15BX683M*	2708	2908	2108	2308
.082 uF	10		CKR15BX823K*	2709	2909	2109	2309
.1 uF	10	CK15BX104K	CKR15BX104K*	2710	2910	2110	2310
.1 uF	20	CK15BX104M	CKR15BX104M*	2711	2911	2111	2311
.12 uF	10	CK15BR124K	CKR15BR124K*	2712	2912	2112	2312
.15 uF	10	CK15BR154K	CKR15BR154K*	2713	2913	2113	2313
.15 uF	20	CK15BR154M	CKR15BR154M*	2714	2914	2114	2314
.18 uF	10	CK15BR184K	CKR15BR184K*	2715	2915	2115	2315
.22 uF	10	CK15BR224K	CKR15BR224K*	2716	2916	2116	2316
.22 uF	20	CK15BR224M	CKR15BR224M*	2717	2917	2117	2317
.27 uF	10	CK15BR274K	CKR15BR274K*	2718	2918	2118	2318
50 WVDC - Axial Leaded - CK15/M39014/05							
.33 uF	10	CK15BR334K	CKR15BR334K*	2719	2919	2119	2319
.33 uF	20	CK15BR334M	CKR15BR334M*	2720	2920	2120	2320
.47 uF	10	CK15BR474K	CKR15BR474K*	2721	2921	2121	2321
.47 uF	20	CK15BR474M	CKR15BR474M*	2722	2922	2122	2322
.68 uF	10		CKR15BR684K*	2723	2923	2123	2323
.68 uF	20		CKR15BR684M*	2724	2924	2124	2324
1.0 uF	10	CK15BR105K	CKR15BR105K*	2725	2925	2125	2325
1.0 uF	20	CK15BR105M	CKR15BR105M*	2726	2926	2126	2326

Cap	Tol %	MIL-C-11015/19	MIL-C-39014/05 Reference	39014/05 Failure Rate Levels M	P	R	S
100 WVDC - Axial Leaded - CK14/M39014/05							
.012 uF	10	CK14BX123K	CKR14BX123K*	2675	2875	2075	2275
.015 uF	10	CK14BX153K	CKR14BX153K*	2676	2876	2076	2276
.015 uF	20	CK14BX153M	CKR14BX153M*	2677	2877	2077	2277
.018 uF	10	CK14BX183K	CKR14BX183K*	2678	2878	2078	2278
.022 uF	10	CK14BX223K	CKR14BX223K*	2679	2879	2079	2279
.022 uF	20	CK14BX223M	CKR14BX223M*	2680	2880	2080	2280
.027 uF	10	CK14BX273K	CKR14BX273K*	2681	2881	2081	2281
.033 uF	10	CK14BX333K	CKR14BX333K*	2682	2882	2082	2282
.033 uF	20	CK14BX333M	CKR14BX333M*	2683	2883	2083	2283
.039 uF	10	CK14BX393K	CKR14BX393K*	2684	2884	2084	2284
.047 uF	10	CK14BX473K	CKR14BX473K*	2685	2885	2085	2285
.047 uF	20	CK14BX473M	CKR14BX473M*	2686	2886	2086	2286
.056 uF	10	CK14BR563K	CKR14BR563K*	2693	2893	2093	2293
.068 uF	10	CK14BR683K	CKR14BR683K*	2694	2894	2094	2294
.068 uF	20	CK14BR683M	CKR14BR683M*	2695	2895	2095	2295
.082 uF	10	CK14BR823K	CKR14BR823K*	2696	2896	2096	2296
.1 uF	10	CK14BR104K	CKR14BR104K*	2697	2897	2097	2297
.1 uF	20	CK14BR104M	CKR14BR104M*	2698	2898	2098	2298
50 WVDC- Axial Leaded - CK14/M39014/05							
.056 uF	10		CKR14BX563K*	2687	2887	2087	2287
.068 uF	10		CKR14BX683K*	2688	2888	2088	2288
.068 uF	20		CKR14BX683M*	2689	2889	2089	2289
.082 uF	10		CKR14BX823K*	2690	2890	2090	2290
.1 uF	10		CKR14BX104K*	2691	2891	2091	2291
.1 uF	20		CKR14BX104M*	2692	2892	2092	2292
.12 uF	10	CK14BR124K	CKR14BR124K*	2699	2899	2099	2299
.15 uF	10	CK14BR154K	CKR14BR154K*	2700	2900	2100	2300
.15 uF	20	CK14BR154M	CKR14BR154M*	2701	2901	2101	2301
.18 uF	10	CK14BR184K	CKR14BR184K*	2702	2902	2102	2302
.22 uF	10	CK14BR224K	CKR14BR224K*	2703	2903	2103	2303
.22 uF	20	CK14BR224M	CKR14BR224M*	2704	2904	2104	2304
.27 uF	10	CK14BR274K	CKR14BR274K*	2705	2905	2105	2305

Cap	Tol %	MIL-C-11015/19	MIL-C-39014/05 Reference	39014/05 Failure Rate Levels M	P	R	S
100 WVDC - Axial Leaded - CK16/M39014/05							
.47 uF	10	CK16BR474K	CKR16BR474K*	2727	2927	2127	2327
.47 uF	20	CK16BR474M	CKR16BR474M*	2728	2928	2128	2328
.68 uF	10		CKR16BR684K*	2729	2929	2129	2329
.68 uF	20		CKR16BR684M*	2730	2930	2130	2330
50 WVDC - Axial Leaded - CK16/M39014/05							
1 uF	10	CK16BR105K	CKR16BR105K*	2731	2931	2131	2331
1 uF	20	CK16BR105M	CKR16BR105M*	2732	2932	2132	2332
2.2 uF	10	CK16BR225K	CKR16BR225K*	2733	2933	2133	2333
2.2 uF	20	CK16BR225M	CKR16BR225M*	2734	2934	2134	2334
3.3 uF	10	CK16BR335K	CKR16BR335K*	2735	2935	2135	2335
3.3 uF	20	CK16BR335M	CKR16BR335M*	2736	2936	2136	2336

Add 'TR to end of part number for Tape & Reel
CK13 - 5,000 per reel, CKR12 - 5,000 per reel
CK14 - 3,000 per reel, CKR14 - 3,000 per reel
CK15 - 500 per reel, CKR15 - 500 per reel
CK16 - 300 per reel, CKR16 - 300 per reel
(Available in full reels only)

* Insert proper letter symbol for Failure Rate Designator:
M = 1% / 1000 Hours, P = 0.1% / 1000 Hours,
R = 0.01% / 1000 Hours, S = 0.001% / 1000 Hours

Part	Inches			mm		
	L	H	T	S	d	L
CK12	.090	.160	.020	2.3	4.0	.51
CKR11	.090	.160	.020	2.3	4.0	.51
CK13	.090	.250	.020	2.3	6.4	.51
CKR12	.090	.250	.020	2.3	6.4	.51
CK14	.140	.390	.025	3.6	9.9	.64
CKR14	.140	.390	.025	3.6	9.9	.64
CK15	.250	.500	.025	6.4	12.7	.64
CKR15	.250	.500	.025	6.4	12.7	.64
CK16	.350	.690	.025	8.9	17.5	.64
CKR16	.350	.690	.025	8.9	17.5	.64

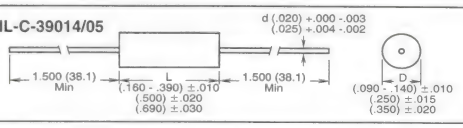
TO ORDER MIL-C-11015 PARTS:

Order by CK part number shown above.
Example: CK05BX104M

TO ORDER MIL-C-39014 PARTS:

Indicate the prefix M39014/-- followed by the applicable MIL dash number.
Example: For M39014/01-1594 (CKR05BX104MS); order M39014/011594

MIL-C-11015/20, MIL-C-39014/05

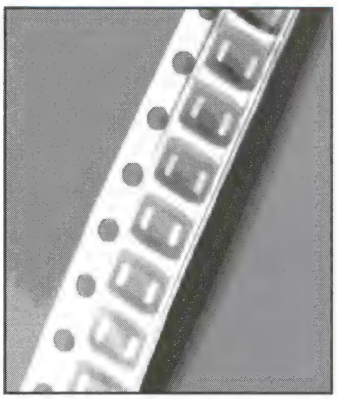


Multilayer Ceramic Capacitors

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Chips
Multilayer Ceramic Capacitors

MALLORY



- Surface Mount
- COG, X7R, Z5U, Y5V Temperature Coefficients
- Nickel Barrier/Solder Terminations
- Tape and Reel — Standard
- 50 Volt Units Can Be Used For 63 Volt Applications

GENERAL SPECIFICATIONS

Voltage Range:
- COG: 10, 16, 25, 50, 100 and 200 VDC
- X7R: 10, 16, 25, 50, 100 and 200 VDC
- Z5U: 50 and 100 VDC
- Y5V: 10, 16, 25 and 50 VDC

Capacitance Range:
- COG: 0.5 pF to .012 µF
- X7R: 150 pF to .33 µF
- Z5U: 6800 pF to .47 µF
- Y5V: .022 µF to 2.2 µF

Standard Sizes: (Four)
0402, 0603, 0805, 1206, 1210
(0603 not available in Z5U Temperature Coefficient)

Tape and Reel:
7" reel per EIA RS 481-1
Parts with ^ (caret) following part number are 2,500 pcs. per reel. Parts with # following part number are 10,000 pieces per reel. All others are 4,000 pcs per reel.
13" reels are available by special request.

Note: Other chip sizes are available upon special request. Contact NACC for availability and prices.

Performance Characteristics

Parameter	COG (NPO)	X7R	Z5U	Y5V
Temperature Characteristics:				
Range, °C:	-55°C to +125°C	-55°C to +125°C	+10°C to +85°C	-30°C to +85°C
Capacitance change without DC voltage:	0±30 PPM/°C*	±15%	+22%, -56%	+22%, -82%
Aging Rate: %ΔC / Decade Hour, Maximum:.	0%	2.5%	5.0%	3.5% 0603; 7% 0805
Dissipation Factor:				
Test Conditions @ 25°C:	>100 pF w/1.0 vrms@1 kHz ≤100 pF w/1.0 vrms@1 MHz	w/1.0 vrms@1 kHz	w/ 0.5 vrms @ 1 kHz	w/ 1.0 vrms @ 1 kHz
Limits:	0.10 % Max	2.5 % Max	4.0 % Max	7.0 % Max
Insulation Resistance (IR):				
After 2 min. electrification @ 25°C with rated voltage applied:	1000 megohms x µF or 100 gigaohms	1000 megohms x µF or 100 gigaohms	1000 megohms x µF or 10 gigaohms	500 megohms x µF or 10,000 Megohms
Moisture Resistance: MIL-STD-202, Method 106 (20 cycles with 50 Volts applied)				
Post test limits @ 25°C, whichever is smaller:	100 megohms x µF or 10 gigaohms	100 megohms x µF or 10 gigaohms	100 megohms x µF or 1 gigaohm	10 megohms x µF or 1,000 Megohms
Immersion Cycling: MIL-STD-202, Method 104, Condition B (2 cycles @ 15 minutes each. Each cycle consists of immersion in hot bath @ 65°C followed by immersion in cold salt water bath.)				
Post test limits @ 25°C :				
Insulation Resistance, whichever is smaller:	100 megohms x µF or 10 gigaohms	100 megohms x µF or 10 gigaohms	100 megohms x µF or 1 gigaohm	10 megohms x µF or 1,000 Megohms
Life Test: - 1000 Hrs.				
Test Potential and Temperature:	200% V @ 125°C	200% V @ 125°C	150% V @ 85°C	200% V @ 85°C
Post test limits @ 25°C:				
Capacitance Change, whichever is greater:	< 2% or 0.5pF	±15% of initial value**	±30% of initial value**	±30% of initial value**
Dissipation Factor:	0.25% Max	2.5% Max	5.0% Max	7.0% Max
Insulation Resistance,whichever is smaller:	100 megohms x µF or 10 gigaohms	100 megohms x µF or 10 gigaohms	100 megohms x µF or 1 gigaohm	10 megohms x µF or 1,000 Megohms
Dielectric Strength 2.5 times rated voltage for 5 seconds with current limited to 50 mA				

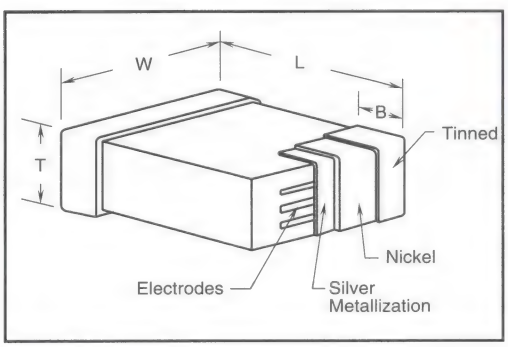
* 60 PPM°C below 10pF nominal
+53 PPM -30 PPM/°C from +25°C to -55°C comparable to MIL-C-20

** X7R and Z5U dielectrics exhibit aging characteristics; therefore, it is highly recommended that capacitors be de-aged for 2 hours @ 150°C and stabilized at room temperature for 48 hours before capacitor measurements are made.

Z5U meets all Y5V requirements and can be used in its place

Y5V - ΔC ≤ +22/-82% over -30°C to +85°C

Z5U - ΔC ≤ +22/-56% over +10°C to +85°C



Dimensions - Millimeters (Inches)

Size Code	L Length	W Width	T Thickness Maximum	B Bandwidth
0402	1.0(.040)±0.05(.002)	0.5(.020)±0.05(.002)	0.55(.022)	0.2(.008)Minimum
0603	1.6(.063)±0.15(.006)	0.8(.032)±0.15(.006)	0.9(.035)	0.35(.014)±0.15(.006)
0805	2.0(.079) ±0.2(.008)	1.25(.049) ±0.2(.008)	1.3(.051)	0.5(.020) ±0.25(.010)
1206	3.2(.126) ±0.2(.008)	1.6(.063) ±0.2(.008)	1.5(.059)	0.5(.020) ±0.25(.010)
1210	3.2(.126) ±0.2(.008)	2.5(.098) ±0.2(.008)	1.7(.067)	0.5(.020) ±0.25(.010)

MALLORY

COG (NPO) Temperature Coefficient

0402 Size Code

NEW

Capacitance	Catalog Number 10 VDC	16VDC	25 VDC	50 VDC
.5pF	C0402C508*8GAC#	C0402C508*4GAC#	C0402C508*3GAC#	C0402C508*5GAC#
.75pF	C0402C758*8GAC#	C0402C758*4GAC#	C0402C758*3GAC#	C0402C758*5GAC#
1.0pF	C0402C109*8GAC#	C0402C109*4GAC#	C0402C109*3GAC#	C0402C109*5GAC#
1.2pF	C0402C129*8GAC#	C0402C129*4GAC#	C0402C129*3GAC#	C0402C129*5GAC#
1.5pF	C0402C159*8GAC#	C0402C159*4GAC#	C0402C159*3GAC#	C0402C159*5GAC#
1.8pF	C0402C189*8GAC#	C0402C189*4GAC#	C0402C189*3GAC#	C0402C189*5GAC#
2.2pF	C0402C229*8GAC#	C0402C229*4GAC#	C0402C229*3GAC#	C0402C229*5GAC#
2.7pF	C0402C279*8GAC#	C0402C279*4GAC#	C0402C279*3GAC#	C0402C279*5GAC#
3.3pF	C0402C339*8GAC#	C0402C339*4GAC#	C0402C339*3GAC#	C0402C339*5GAC#
3.9pF	C0402C399*8GAC#	C0402C399*4GAC#	C0402C399*3GAC#	C0402C399*5GAC#
4.7pF	C0402C479*8GAC#	C0402C479*4GAC#	C0402C479*3GAC#	C0402C479*5GAC#
5.6pF	C0402C569*8GAC#	C0402C569*4GAC#	C0402C569*3GAC#	C0402C569*5GAC#
6.8pF	C0402C689*8GAC#	C0402C689*4GAC#	C0402C689*3GAC#	C0402C689*5GAC#
8.2pF	C0402C829*8GAC#	C0402C829*4GAC#	C0402C829*3GAC#	C0402C829*5GAC#
10pF	C0402C100*8GAC#	C0402C100*4GAC#	C0402C100*3GAC#	C0402C100*5GAC#
12pF	C0402C120*8GAC#	C0402C120*4GAC#	C0402C120*3GAC#	C0402C120*5GAC#
15pF	C0402C150*8GAC#	C0402C150*4GAC#	C0402C150*3GAC#	C0402C150*5GAC#
18pF	C0402C180*8GAC#	C0402C180*4GAC#	C0402C180*3GAC#	C0402C180*5GAC#
22pF	C0402C220*8GAC#	C0402C220*4GAC#	C0402C220*3GAC#	C0402C220*5GAC#
27pF	C0402C270*8GAC#	C0402C270*4GAC#	C0402C270*3GAC#	C0402C270*5GAC#
33pF	C0402C330*8GAC#	C0402C330*4GAC#	C0402C330*3GAC#	C0402C330*5GAC#
39pF	C0402C390*8GAC#	C0402C390*4GAC#	C0402C390*3GAC#	C0402C390*5GAC#
47pF	C0402C470*8GAC#	C0402C470*4GAC#	C0402C470*3GAC#	C0402C470*5GAC#
56pF	C0402C560*8GAC#	C0402C560*4GAC#	C0402C560*3GAC#	C0402C560*5GAC#
68pF	C0402C680*8GAC#	C0402C680*4GAC#	C0402C680*3GAC#	C0402C680*5GAC#
82pF	C0402C820*8GAC#	C0402C820*4GAC#	C0402C820*3GAC#	
100pF	C0402C101*8GAC#	C0402C101*4GAC#	C0402C101*3GAC#	

* Insert proper letter code for desired tolerance:
±0.25pF (C) is standard on values less than 10 pF
±5% (J) is standard on values ≥ 10 pF

Other Available Tolerances:
Values less than 27pF:
C= ±0.25pF, D= ±0.5pF
Values greater than 10 pF:
F= ±1%; G= ±2%; H= ±2.5%;
J= ±5%; K= ±10%; M= ±20%

^ Parts with caret (^) following catalog number are 2,500 pcs per reel.
# Parts with (#) following catalog number are 10,000 pcs per reel.
All others are 4,000 pcs per reel

0603 Size Code

Capacitance	Catalog Number 50 VDC	100 VDC	200 VDC
.5pF	C0603C508*5GAC		
.75pF	C0603C758*5GAC		
1.0pF	C0603C109*5GAC	C0603C109*1GAC	C0603C109*2GAC
1.2pF	C0603C129*5GAC	C0603C129*1GAC	C0603C129*2GAC
1.5pF	C0603C159*5GAC	C0603C159*1GAC	C0603C159*2GAC
1.8pF	C0603C189*5GAC	C0603C189*1GAC	C0603C189*2GAC
2.2pF	C0603C229*5GAC	C0603C229*1GAC	C0603C229*2GAC
2.7pF	C0603C279*5GAC	C0603C279*1GAC	C0603C279*2GAC
3.3pF	C0603C339*5GAC	C0603C339*1GAC	C0603C339*2GAC
3.9pF	C0603C399*5GAC	C0603C399*1GAC	C0603C399*2GAC
4.7pF	C0603C479*5GAC	C0603C479*1GAC	C0603C479*2GAC
5.6pF	C0603C569*5GAC	C0603C569*1GAC	C0603C569*2GAC
6.8pF	C0603C689*5GAC	C0603C689*1GAC	C0603C689*2GAC
8.2pF	C0603C829*5GAC	C0603C829*1GAC	C0603C829*2GAC
10pF	C0603C100*5GAC	C0603C100*1GAC	C0603C100*2GAC
12pF	C0603C120*5GAC	C0603C120*1GAC	C0603C120*2GAC
15pF	C0603C150*5GAC	C0603C150*1GAC	C0603C150*2GAC
18pF	C0603C180*5GAC	C0603C180*1GAC	C0603C180*2GAC
22pF	C0603C220*5GAC	C0603C220*1GAC	C0603C220*2GAC
27pF	C0603C270*5GAC	C0603C270*1GAC	C0603C270*2GAC
33pF	C0603C330*5GAC	C0603C330*1GAC	C0603C330*2GAC
39pF	C0603C390*5GAC	C0603C390*1GAC	C0603C390*2GAC
47pF	C0603C470*5GAC	C0603C470*1GAC	C0603C470*2GAC
56pF	C0603C560*5GAC	C0603C560*1GAC	C0603C560*2GAC
68pF	C0603C680*5GAC	C0603C680*1GAC	C0603C680*2GAC
82pF	C0603C820*5GAC	C0603C820*1GAC	C0603C820*2GAC
100pF	C0603C101*5GAC	C0603C101*1GAC	
120pF	C0603C121*5GAC	C0603C121*1GAC	
150pF	C0603C151*5GAC	C0603C151*1GAC	
180pF	C0603C181*5GAC	C0603C181*1GAC	
220pF	C0603C221*5GAC		

0805 Size Code

Capacitance	Catalog Number 50 VDC	100 VDC	200 VDC
1.0pF	C0805C109*5GAC	C0805C109*1GAC	C0805C109*2GAC
1.2pF	C0805C129*5GAC	C0805C129*1GAC	C0805C129*2GAC
1.5pF	C0805C159*5GAC	C0805C159*1GAC	C0805C159*2GAC
1.8pF	C0805C189*5GAC	C0805C189*1GAC	C0805C189*2GAC
2.2pF	C0805C229*5GAC	C0805C229*1GAC	C0805C229*2GAC
2.7pF	C0805C279*5GAC	C0805C279*1GAC	C0805C279*2GAC
3.3pF	C0805C339*5GAC	C0805C339*1GAC	C0805C339*2GAC
3.9pF	C0805C399*5GAC	C0805C399*1GAC	C0805C399*2GAC
4.7pF	C0805C479*5GAC	C0805C479*1GAC	C0805C479*2GAC
5.6pF	C0805C569*5GAC	C0805C569*1GAC	C0805C569*2GAC
6.8pF	C0805C689*5GAC	C0805C689*1GAC	C0805C689*2GAC
8.2pF	C0805C829*5GAC	C0805C829*1GAC	C0805C829*2GAC
10pF	C0805C100*5GAC	C0805C100*1GAC	C0805C100*2GAC
12pF	C0805C120*5GAC	C0805C120*1GAC	C0805C120*2GAC
15pF	C0805C150*5GAC	C0805C150*1GAC	C0805C150*2GAC
18pF	C0805C180*5GAC	C0805C180*1GAC	C0805C180*2GAC
22pF	C0805C220*5GAC	C0805C220*1GAC	C0805C220*2GAC
27pF	C0805C270*5GAC	C0805C270*1GAC	C0805C270*2GAC
33pF	C0805C330*5GAC	C0805C330*1GAC	C0805C330*2GAC
39pF	C0805C390*5GAC	C0805C390*1GAC	C0805C390*2GAC
47pF	C0805C470*5GAC	C0805C470*1GAC	C0805C470*2GAC
56pF	C0805C560*5GAC	C0805C560*1GAC	C0805C560*2GAC
68pF	C0805C680*5GAC	C0805C680*1GAC	C0805C680*2GAC
82pF	C0805C820*5GAC	C0805C820*1GAC	C0805C820*2GAC
100pF	C0805C101*5GAC	C0805C101*1GAC	C0805C101*2GAC
120pF	C0805C121*5GAC	C0805C121*1GAC	C0805C121*2GAC
150pF	C0805C151*5GAC	C0805C151*1GAC	C0805C151*2GAC
180pF	C0805C181*5GAC	C0805C181*1GAC	C0805C181*2GAC
220pF	C0805C221*5GAC	C0805C221*1GAC	C0805C221*2GAC
270pF	C0805C271*5GAC	C0805C271*1GAC	C0805C271*2GAC^
330pF	C0805C331*5GAC	C0805C331*1GAC	C0805C331*2GAC^

50 volt units can be used for 63 volt applications

See next page for more COG (NPO) parts

MALLORY

COG (NPO) Temperature Coefficient

0805 Size Code

Capacitance	Catalog Number		
	50 VDC	100 VDC	200 VDC
390pF	C0805C391*5GAC	C0805C391*1GAC	C0805C391*2GAC^
470pF	C0805C471*5GAC	C0805C471*1GAC	C0805C471*2GAC^
560pF	C0805C561*5GAC	C0805C561*1GAC	
680pF	C0805C681*5GAC	C0805C681*1GAC ^	
820pF	C0805C821*5GAC	C0805C821*1GAC ^	
1000pF	C0805C102*5GAC	C0805C102*1GAC ^	
1200pF	C0805C122*5GAC		
1500pF	C0805C152*5GAC		
1800pF	C0805C182*5GAC		

1206 Size Code

Capacitance	Catalog Number		
	50 VDC	100 VDC	200 VDC
1.0pF	C1206C109*5GAC	C1206C109*1GAC	C1206C109*2GAC
1.2pF	C1206C129*5GAC	C1206C129*1GAC	C1206C129*2GAC
1.5pF	C1206C159*5GAC	C1206C159*1GAC	C1206C159*2GAC
1.8pF	C1206C189*5GAC	C1206C189*1GAC	C1206C189*2GAC
2.2pF	C1206C229*5GAC	C1206C229*1GAC	C1206C229*2GAC
2.7pF	C1206C279*5GAC	C1206C279*1GAC	C1206C279*2GAC
3.3pF	C1206C339*5GAC	C1206C339*1GAC	C1206C339*2GAC
3.9pF	C1206C399*5GAC	C1206C399*1GAC	C1206C399*2GAC
4.7pF	C1206C479*5GAC	C1206C479*1GAC	C1206C479*2GAC
5.6pF	C1206C569*5GAC	C1206C569*1GAC	C1206C569*2GAC
6.8pF	C1206C689*5GAC	C1206C689*1GAC	C1206C689*2GAC
8.2pF	C1206C829*5GAC	C1206C829*1GAC	C1206C829*2GAC
10pF	C1206C100*5GAC	C1206C100*1GAC	C1206C100*2GAC
12pF	C1206C120*5GAC	C1206C120*1GAC	C1206C120*2GAC
15pF	C1206C150*5GAC	C1206C150*1GAC	C1206C150*2GAC
18pF	C1206C180*5GAC	C1206C180*1GAC	C1206C180*2GAC
22pF	C1206C220*5GAC	C1206C220*1GAC	C1206C220*2GAC
27pF	C1206C270*5GAC	C1206C270*1GAC	C1206C270*2GAC
33pF	C1206C330*5GAC	C1206C330*1GAC	C1206C330*2GAC
39pF	C1206C390*5GAC	C1206C390*1GAC	C1206C390*2GAC
47pF	C1206C470*5GAC	C1206C470*1GAC	C1206C470*2GAC
56pF	C1206C560*5GAC	C1206C560*1GAC	C1206C560*2GAC
68pF	C1206C680*5GAC	C1206C680*1GAC	C1206C680*2GAC
82pF	C1206C820*5GAC	C1206C820*1GAC	C1206C820*2GAC
100pF	C1206C101*5GAC	C1206C101*1GAC	C1206C101*2GAC
120pF	C1206C121*5GAC	C1206C121*1GAC	C1206C121*2GAC
150pF	C1206C151*5GAC	C1206C151*1GAC	C1206C151*2GAC
180pF	C1206C181*5GAC	C1206C181*1GAC	C1206C181*2GAC
220pF	C1206C221*5GAC	C1206C221*1GAC	C1206C221*2GAC
270pF	C1206C271*5GAC	C1206C271*1GAC	C1206C271*2GAC
330pF	C1206C331*5GAC	C1206C331*1GAC	C1206C331*2GAC
390pF	C1206C391*5GAC	C1206C391*1GAC	C1206C391*2GAC
470pF	C1206C471*5GAC	C1206C471*1GAC	C1206C471*2GAC
560pF	C1206C561*5GAC	C1206C561*1GAC	C1206C561*2GAC
680pF	C1206C681*5GAC	C1206C681*1GAC	C1206C681*2GAC
820pF	C1206C821*5GAC	C1206C821*1GAC	C1206C821*2GAC
1000pF	C1206C102*5GAC	C1206C102*1GAC	C1206C102*2GAC^
1200pF	C1206C122*5GAC	C1206C122*1GAC	C1206C122*2GAC^
1500pF	C1206C152*5GAC	C1206C152*1GAC	C1206C152*2GAC^
1800pF	C1206C182*5GAC	C1206C182*1GAC	C1206C182*2GAC^
2200pF	C1206C222*5GAC	C1206C222*1GAC ^	
2700pF	C1206C272*5GAC	C1206C272*1GAC ^	
3300pF	C1206C332*5GAC	C1206C332*1GAC ^	
3900pF	C1206C392*5GAC	C1206C392*1GAC ^	
4700pF	C1206C472*5GAC		
5600pF	C1206C562*5GAC		

1210 Size Code

Capacitance	Catalog Number		
	50 VDC	100 VDC	200 VDC
10pF	C1210C100*5GAC	C1210C100*1GAC	C1210C100*2GAC
12pF	C1210C120*5GAC	C1210C120*1GAC	C1210C120*2GAC
15pF	C1210C150*5GAC	C1210C150*1GAC	C1210C150*2GAC
18pF	C1210C180*5GAC	C1210C180*1GAC	C1210C180*2GAC
22pF	C1210C220*5GAC	C1210C220*1GAC	C1210C220*2GAC
27pF	C1210C270*5GAC	C1210C270*1GAC	C1210C270*2GAC
33pF	C1210C330*5GAC	C1210C330*1GAC	C1210C330*2GAC
39pF	C1210C390*5GAC	C1210C390*1GAC	C1210C390*2GAC
47pF	C1210C470*5GAC	C1210C470*1GAC	C1210C470*2GAC
56pF	C1210C560*5GAC	C1210C560*1GAC	C1210C560*2GAC
68pF	C1210C680*5GAC	C1210C680*1GAC	C1210C680*2GAC
82pF	C1210C820*5GAC	C1210C820*1GAC	C1210C820*2GAC
100pF	C1210C101*5GAC	C1210C101*1GAC	C1210C101*2GAC
120pF	C1210C121*5GAC	C1210C121*1GAC	C1210C121*2GAC
150pF	C1210C151*5GAC	C1210C151*1GAC	C1210C151*2GAC
180pF	C1210C181*5GAC	C1210C181*1GAC	C1210C181*2GAC
220pF	C1210C221*5GAC	C1210C221*1GAC	C1210C221*2GAC
270pF	C1210C271*5GAC	C1210C271*1GAC	C1210C271*2GAC
330pF	C1210C331*5GAC	C1210C331*1GAC	C1210C331*2GAC
390pF	C1210C391*5GAC	C1210C391*1GAC	C1210C391*2GAC
470pF	C1210C471*5GAC	C1210C471*1GAC	C1210C471*2GAC
560pF	C1210C561*5GAC	C1210C561*1GAC	C1210C561*2GAC
680pF	C1210C681*5GAC	C1210C681*1GAC	C1210C681*2GAC
820pF	C1210C821*5GAC	C1210C821*1GAC	C1210C821*2GAC
1000pF	C1210C102*5GAC	C1210C102*1GAC	C1210C102*2GAC
1200pF	C1210C122*5GAC	C1210C122*1GAC	C1210C122*2GAC
1500pF	C1210C152*5GAC	C1210C152*1GAC	C1210C152*2GAC
1800pF	C1210C182*5GAC	C1210C182*1GAC	C1210C182*2GAC
2200pF	C1210C222*5GAC	C1210C222*1GAC	C1210C222*2GAC^
2700pF	C1210C272*5GAC	C1210C272*1GAC	C1210C272*2GAC^
3300pF	C1210C332*5GAC	C1210C332*1GAC	C1210C332*2GAC^
3900pF	C1210C392*5GAC	C1210C392*1GAC ^	
4700pF	C1210C472*5GAC ^	C1210C472*1GAC ^	
5600pF	C1210C562*5GAC ^	C1210C562*1GAC ^	
6800pF	C1210C682*5GAC ^	C1210C682*1GAC ^	
8200pF	C1210C822*5GAC ^		
10000pF	C1210C103*5GAC ^		
12000pF	C1210C123*5GAC ^		

* Insert proper letter code for desired tolerance:
- ±0.25pF (C) is standard on values less than 10 pF
- ±5% (J) is standard on values ≥ 10 pF

Other Available Tolerances:
Values less than 27pF:
C= ±0.25pF, D= ±0.5pF
Values greater than 10 pF:
F= ±1%; G= ±2%; H= ±2.5%;
J= ±5%; K= ±10%; M= ±20%

^ Parts with caret (^) following catalog number are 2,500 pcs per reel
All others are 4,000 pcs per reel

50 volt units can be used for 63 volt applications

MALLORY

X7R Temperature Coefficient

NEW

0402 Size Code

Capacitance	Catalog Number			
	10 VDC	16VDC	25 VDC	50 VDC
150pF	C0402C151*8RAC#	C0402C151*4RAC#	C0402C151*3RAC#	C0402C151*5RAC#
180pF	C0402C181*8RAC#	C0402C181*4RAC#	C0402C181*3RAC#	C0402C181*5RAC#
220pF	C0402C221*8RAC#	C0402C221*4RAC#	C0402C221*3RAC#	C0402C221*5RAC#
270pF	C0402C271*8RAC#	C0402C271*4RAC#	C0402C271*3RAC#	C0402C271*5RAC#
330pF	C0402C331*8RAC#	C0402C331*4RAC#	C0402C331*3RAC#	C0402C331*5RAC#
390pF	C0402C391*8RAC#	C0402C391*4RAC#	C0402C391*3RAC#	C0402C391*5RAC#
470pF	C0402C471*8RAC#	C0402C471*4RAC#	C0402C471*3RAC#	C0402C471*5RAC#
560pF	C0402C561*8RAC#	C0402C561*4RAC#	C0402C561*3RAC#	C0402C561*5RAC#
680pF	C0402C681*8RAC#	C0402C681*4RAC#	C0402C681*3RAC#	C0402C681*5RAC#
820pF	C0402C821*8RAC#	C0402C821*4RAC#	C0402C821*3RAC#	C0402C821*5RAC#
1000pF	C0402C102*8RAC#	C0402C102*4RAC#	C0402C102*3RAC#	C0402C102*5RAC#
1200pF	C0402C122*8RAC#	C0402C122*4RAC#	C0402C122*3RAC#	C0402C122*5RAC#
1500pF	C0402C152*8RAC#	C0402C152*4RAC#	C0402C152*3RAC#	C0402C152*5RAC#
1800pF	C0402C182*8RAC#	C0402C182*4RAC#	C0402C182*3RAC#	
2200pF	C0402C222*8RAC#	C0402C222*4RAC#	C0402C222*3RAC#	
2700pF	C0402C272*8RAC#	C0402C272*4RAC#	C0402C272*3RAC#	
3300pF	C0402C332*8RAC#	C0402C332*4RAC#	C0402C332*3RAC#	
3900pF	C0402C392*8RAC#	C0402C392*4RAC#	C0402C392*3RAC#	
4700pF	C0402C472*8RAC#	C0402C472*4RAC#	C0402C472*3RAC#	

0603 Size Code

Capacitance	Catalog Number		
	50 VDC	100 VDC	200 VDC
180pF	C0603C181*5RAC	C0603C181*1RAC	C0603C181*2RAC
220pF	C0603C221*5RAC	C0603C221*1RAC	C0603C221*2RAC
270pF	C0603C271*5RAC	C0603C271*1RAC	C0603C271*2RAC
330pF	C0603C331*5RAC	C0603C331*1RAC	C0603C331*2RAC
390pF	C0603C391*5RAC	C0603C391*1RAC	C0603C391*2RAC
470pF	C0603C471*5RAC	C0603C471*1RAC	C0603C471*2RAC
560pF	C0603C561*5RAC	C0603C561*1RAC	C0603C561*2RAC
680pF	C0603C681*5RAC	C0603C681*1RAC	C0603C681*2RAC
820pF	C0603C821*5RAC	C0603C821*1RAC	C0603C821*2RAC
1000pF	C0603C102*5RAC	C0603C102*1RAC	C0603C102*2RAC
1200pF	C0603C122*5RAC	C0603C122*1RAC	
1500pF	C0603C152*5RAC	C0603C152*1RAC	
1800pF	C0603C182*5RAC	C0603C182*1RAC	
2200pF	C0603C222*5RAC	C0603C222*1RAC	
2700pF	C0603C272*5RAC	C0603C272*1RAC	
3300pF	C0603C332*5RAC	C0603C332*1RAC	
3900pF	C0603C392*5RAC	C0603C392*1RAC	
4700pF	C0603C472*5RAC	C0603C472*1RAC	
5600pF	C0603C562*5RAC		
6800pF	C0603C682*5RAC		
8200pF	C0603C822*5RAC		
10000pF	C0603C103*5RAC		
12000pF	C0603C123*5RAC		
15000pF	C0603C153*5RAC		
18000pF	C0603C183*5RAC		

0805 Size Code

Capacitance	Catalog Number		
	50 VDC	100 VDC	200 VDC
220pF	C0805C221*5RAC	C0805C221*1RAC	C0805C221*2RAC
270pF	C0805C271*5RAC	C0805C271*1RAC	C0805C271*2RAC
330pF	C0805C331*5RAC	C0805C331*1RAC	C0805C331*2RAC
390pF	C0805C391*5RAC	C0805C391*1RAC	C0805C391*2RAC
470pF	C0805C471*5RAC	C0805C471*1RAC	C0805C471*2RAC
560pF	C0805C561*5RAC	C0805C561*1RAC	C0805C561*2RAC
680pF	C0805C681*5RAC	C0805C681*1RAC	C0805C681*2RAC
820pF	C0805C821*5RAC	C0805C821*1RAC	C0805C821*2RAC
1000pF	C0805C102*5RAC	C0805C102*1RAC	C0805C102*2RAC
1200pF	C0805C122*5RAC	C0805C122*1RAC	C0805C122*2RAC
1500pF	C0805C152*5RAC	C0805C152*1RAC	C0805C152*2RAC
1800pF	C0805C182*5RAC	C0805C182*1RAC	C0805C182*2RAC
2200pF	C0805C222*5RAC	C0805C222*1RAC	C0805C222*2RAC
2700pF	C0805C272*5RAC	C0805C272*1RAC	C0805C272*2RAC
3300pF	C0805C332*5RAC	C0805C332*1RAC	C0805C332*2RAC
3900pF	C0805C392*5RAC	C0805C392*1RAC	C0805C392*2RAC
4700pF	C0805C472*5RAC	C0805C472*1RAC	C0805C472*2RAC
5600pF	C0805C562*5RAC	C0805C562*1RAC	C0805C562*2RAC
6800pF	C0805C682*5RAC	C0805C682*1RAC	C0805C682*2RAC
8200pF	C0805C822*5RAC	C0805C822*1RAC	
10000pF	C0805C103*5RAC	C0805C103*1RAC	
12000pF	C0805C123*5RAC		
15000pF	C0805C153*5RAC		
18000pF	C0805C183*5RAC		
22000pF	C0805C223*5RAC		
27000pF	C0805C273*5RAC		
33000pF	C0805C333*5RAC		
39000pF	C0805C393*5RAC		
47000pF	C0805C473*5RAC		
56000pF	C0805C563*5RAC		
68000pF	C0805C683*5RAC		
82000pF	C0805C823*5RAC		
.1uF	C0805C104*5RAC		

* Insert proper letter code for desired tolerance:
±10 (K) Tolerance is standard
J = ±5%, K = ±10%, M = ±20%

^ Parts with caret (^) following catalog number are 2,500 pcs per reel.

Parts with (#) following catalog number are 10,000 pcs per reel.

All others are 4,000 pcs per reel

50 volt units can be used for 63 volt applications

MALLORY

X7R Temperature Coefficient

1206 Size Code

Capacitance	Catalog Number 50 VDC	100 VDC	200 VDC
1000pF	C1206C102*5RAC	C1206C102*1RAC	C1206C102*2RAC
1200pF	C1206C122*5RAC	C1206C122*1RAC	C1206C122*2RAC
1500pF	C1206C152*5RAC	C1206C152*1RAC	C1206C152*2RAC
1800pF	C1206C182*5RAC	C1206C182*1RAC	C1206C182*2RAC
2200pF	C1206C222*5RAC	C1206C222*1RAC	C1206C222*2RAC
2700pF	C1206C272*5RAC	C1206C272*1RAC	C1206C272*2RAC
3300pF	C1206C332*5RAC	C1206C332*1RAC	C1206C332*2RAC
3900pF	C1206C392*5RAC	C1206C392*1RAC	C1206C392*2RAC
4700pF	C1206C472*5RAC	C1206C472*1RAC	C1206C472*2RAC
5600pF	C1206C562*5RAC	C1206C562*1RAC	C1206C562*2RAC
6800pF	C1206C682*5RAC	C1206C682*1RAC	C1206C682*2RAC
8200pF	C1206C822*5RAC	C1206C822*1RAC	C1206C822*2RAC
10000pF	C1206C103*5RAC	C1206C103*1RAC	C1206C103*2RAC
12000pF	C1206C123*5RAC	C1206C123*1RAC	C1206C123*2RAC
15000pF	C1206C153*5RAC	C1206C153*1RAC	C1206C153*2RAC
18000pF	C1206C183*5RAC	C1206C183*1RAC	C1206C183*2RAC
22000pF	C1206C223*5RAC	C1206C223*1RAC	C1206C223*2RAC
27000pF	C1206C273*5RAC	C1206C273*1RAC	
33000pF	C1206C333*5RAC	C1206C333*1RAC	
39000pF	C1206C393*5RAC	C1206C393*1RAC	
47000pF	C1206C473*5RAC	C1206C473*1RAC	
56000pF	C1206C563*5RAC		
68000pF	C1206C683*5RAC		
82000pF	C1206C823*5RAC		
.1uF	C1206C104*5RAC		
.12uF	C1206C124*5RAC ^		
.15uF	C1206C154*5RAC ^		
.18 uF	C1206C184*5RAC ^		
.22 uF	C1206C224*5RAC ^		

1210 Size Code

Capacitance	Catalog Number 50 VDC	100 VDC	200 VDC
2200pF	C1210C222*5RAC	C1210C222*1RAC	C1210C222*2RAC
2700pF	C1210C272*5RAC	C1210C272*1RAC	C1210C272*2RAC
3300pF	C1210C332*5RAC	C1210C332*1RAC	C1210C332*2RAC
3900pF	C1210C392*5RAC	C1210C392*1RAC	C1210C392*2RAC
4700pF	C1210C472*5RAC	C1210C472*1RAC	C1210C472*2RAC
5600pF	C1210C562*5RAC	C1210C562*1RAC	C1210C562*2RAC
6800pF	C1210C682*5RAC	C1210C682*1RAC	C1210C682*2RAC
8200pF	C1210C822*5RAC	C1210C822*1RAC	C1210C822*2RAC
10000pF	C1210C103*5RAC	C1210C103*1RAC	C1210C103*2RAC
12000pF	C1210C123*5RAC	C1210C123*1RAC	C1210C123*2RAC
15000pF	C1210C153*5RAC	C1210C153*1RAC	C1210C153*2RAC
18000pF	C1210C183*5RAC	C1210C183*1RAC	C1210C183*2RAC
22000pF	C1210C223*5RAC	C1210C223*1RAC	C1210C223*2RAC
27000pF	C1210C273*5RAC	C1210C273*1RAC	C1210C273*2RAC
33000pF	C1210C333*5RAC	C1210C333*1RAC	C1210C333*2RAC
39000pF	C1210C393*5RAC	C1210C393*1RAC	C1210C393*2RAC
47000pF	C1210C473*5RAC	C1210C473*1RAC	C1210C473*2RAC
56000pF	C1210C563*5RAC	C1210C563*1RAC	
68000pF	C1210C683*5RAC	C1210C683*1RAC	
82000pF	C1210C823*5RAC	C1210C823*1RAC	
.1uF	C1210C104*5RAC	C1210C104*1RAC ^	
.12uF	C1210C124*5RAC		
.15uF	C1210C154*5RAC		
.18uF	C1210C184*5RAC		
.22uF	C1210C224*5RAC ^		
.27uF	C1210C274*5RAC ^		
.33uF	C1210C334*5RAC ^		

* Insert proper letter code for desired tolerance:
±10 (K) Tolerance is standard
J = ±5%, K = ±10%, M = ±20%

^ Parts with caret (^) following catalog number are 2,500 pcs per reel.
All others are 4,000 pcs per reel

50 volt units can be used for 63 volt applications

MALLORY

Z5U Temperature Coefficient

0805 Size Code

Capacitance	Catalog Number 50 VDC	100 VDC	200 VDC
6800pF	C0805C682*5UAC	C0805C682*1UAC	
8200pF	C0805C822*5UAC	C0805C822*1UAC	
10000pF	C0805C103*5UAC	C0805C103*1UAC	
12000pF	C0805C123*5UAC		
15000pF	C0805C153*5UAC		
18000pF	C0805C183*5UAC		
22000pF	C0805C223*5UAC		
27000pF	C0805C273*5UAC		
33000pF	C0805C333*5UAC		
39000pF	C0805C393*5UAC		
47000pF	C0805C473*5UAC		
56000pF	C0805C563*5UAC		
68000pF	C0805C683*5UAC		
82000pF	C0805C823*5UAC		
.1uF	C0805C104*5UAC		

1206 Size Code

Capacitance	Catalog Number 50 VDC	100 VDC	200 VDC
10000pF	C1206C103*5UAC	C1206C103*1UAC	
12000pF	C1206C123*5UAC	C1206C123*1UAC	
15000pF	C1206C153*5UAC	C1206C153*1UAC	
18000pF	C1206C183*5UAC	C1206C183*1UAC	
22000pF	C1206C223*5UAC	C1206C223*1UAC	
27000pF	C1206C273*5UAC	C1206C273*1UAC	
33000pF	C1206C333*5UAC	C1206C333*1UAC	
39000pF	C1206C393*5UAC	C1206C393*1UAC	
47000pF	C1206C473*5UAC		
56000pF	C1206C563*5UAC		
68000pF	C1206C683*5UAC		
82000pF	C1206C823*5UAC		
.1uF	C1206C104*5UAC		
.12uF	C1206C124*5UAC		
.15uF	C1206C154*5UAC		
.18uF	C1206C184*5UAC		
.22uF	C1206C224*5UAC		

1210 Size Code

Capacitance	Catalog Number 50 VDC	100 VDC	200 VDC
47000pF	C1210C473*5UAC	C1210C473*1UAC	
56000pF	C1210C563*5UAC	C1210C563*1UAC	
68000pF	C1210C683*5UAC	C1210C683*1UAC	
82000pF	C1210C823*5UAC	C1210C823*1UAC	
.1uF	C1210C104*5UAC		
.15uF	C1210C154*5UAC		
.18uF	C1210C184*5UAC		
.22uF	C1210C224*5UAC		
.27uF	C1210C274*5UAC		
.33uF	C1210C334*5UAC		
.39uF	C1210C394*5UAC		
.47uF	C1210C474*5UAC		

* Insert proper letter code for desired tolerance:
±20 (M) Tolerance is standard
M = ±20%; Z = +80%-0%

50 volt units can be used for 63 volt applications

Z5U meets all Y5V requirements and can be used in its place

Y5V - $\Delta C \leq +22/-82\%$ over -30°C to +85°C

Z5U - $\Delta C \leq +22/-56\%$ over +10°C to +85°C

MALLORY

Y5V Temperature Coefficient

0603 Size Code

Capacitance	Catalog Number		
	10 VDC	16 VDC	25 VDC
22000 pF	C0603C223*8VAC	C0603C223*4VAC	C0603C223*3VAC
27000 pF	C0603C273*8VAC	C0603C273*4VAC	C0603C273*3VAC
33000 pF	C0603C333*8VAC	C0603C333*4VAC	C0603C333*3VAC
39000 pF	C0603C393*8VAC	C0603C393*4VAC	C0603C393*3VAC
47000 pF	C0603C473*8VAC	C0603C473*4VAC	C0603C473*3VAC
56000 pF	C0603C563*8VAC	C0603C563*4VAC	C0603C563*3VAC
68000 pF	C0603C683*8VAC	C0603C683*4VAC	C0603C683*3VAC
82000 pF	C0603C823*8VAC	C0603C823*4VAC	C0603C823*3VAC
.1uF	C0603C104*8VAC	C0603C104*4VAC	C0603C104*3VAC
NEW .15uF	C0603C154*8VAC	C0603C154*4VAC	C0603C154*3VAC
NEW .22uF	C0603C224*8VAC	C0603C224*4VAC	C0603C224*3VAC

1206 Size Code

NEW

Capacitance	Catalog Number		
	10 VDC	16VDC	25 VDC
.22uF	C1206C224*8VAC	C1206C224*4VAC	C1206C224*3VAC
.33uF	C1206C334*8VAC	C1206C334*4VAC	C1206C334*3VAC
.47uF	C1206C474*8VAC	C1206C474*4VAC	C1206C474*3VAC
.68uF	C1206C684*8VAC	C1206C684*4VAC	C1206C684*3VAC
1.0uF	C1206C105*8VAC	C1206C105*4VAC	C1206C105*3VAC
2.2uF	C1206C225*8VAC	C1206C225*4VAC	

0805 Size Code

Capacitance	Catalog Number			
	10 VDC	16 VDC	25 VDC	50 VDC
22000 pF	C0805C223*8VAC	C0805C223*4VAC	C0805C223*3VAC	C0805C223*5VAC
27000 pF	C0805C273*8VAC	C0805C273*4VAC	C0805C273*3VAC	C0805C273*5VAC
33000 pF	C0805C333*8VAC	C0805C333*4VAC	C0805C333*3VAC	C0805C333*5VAC
39000 pF	C0805C393*8VAC	C0805C393*4VAC	C0805C393*3VAC	C0805C393*5VAC
47000 pF	C0805C473*8VAC	C0805C473*4VAC	C0805C473*3VAC	C0805C473*5VAC
56000 pF	C0805C563*8VAC	C0805C563*4VAC	C0805C563*3VAC	C0805C563*5VAC
68000 pF	C0805C683*8VAC	C0805C683*4VAC	C0805C683*3VAC	C0805C683*5VAC
82000 pF	C0805C823*8VAC	C0805C823*4VAC	C0805C823*3VAC	C0805C823*5VAC
.1uF	C0805C104*8VAC	C0805C104*4VAC	C0805C104*3VAC	C0805C104*5VAC
.15uF	C0805C154*8VAC	C0805C154*4VAC	C0805C154*3VAC	
.22uF	C0805C224*8VAC	C0805C224*4VAC	C0805C224*3VAC	
NEW .33uF	C0805C334*8VAC	C0805C334*4VAC	C0805C334*3VAC	
.47uF	C0805C474*8VAC	C0805C474*4VAC	C0805C474*3VAC	
.68uF	C0805C684*8VAC	C0805C684*4VAC	C0805C684*3VAC	
1.0uF	C0805C105*8VAC	C0805C105*4VAC	C0805C105*3VAC	

1210 Size Code

NEW

Capacitance	Catalog Number	
	10 VDC	16VDC
.22uF	C1210C224*8VAC	C1210C224*4VAC
.33uF	C1210C334*8VAC	C1210C334*4VAC
.47uF	C1210C474*8VAC	C1210C474*4VAC
.68uF	C1210C684*8VAC	C1210C684*4VAC
1.0uF	C1210C105*8VAC	C1210C105*4VAC
2.2uF	C1210C225*8VAC	C1210C225*4VAC
3.3uF	C1210C335*8VAC	C1210C335*4VAC
4.7uF	C1210C475*8VAC	C1210C475*4VAC

* Insert proper letter code for desired tolerance:
M = ±20%; Z = +80%-0%

All Y5V units are supplied 4,000 pcs per reel

50 volt units can be used for 63 volt applications

Index
DC Film Capacitors

MALLORY

Index
DC Film Capacitors

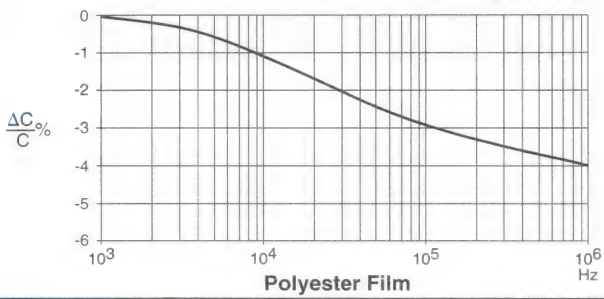
MALLORY

Note: Other QUENCHARC® ratings available by special request

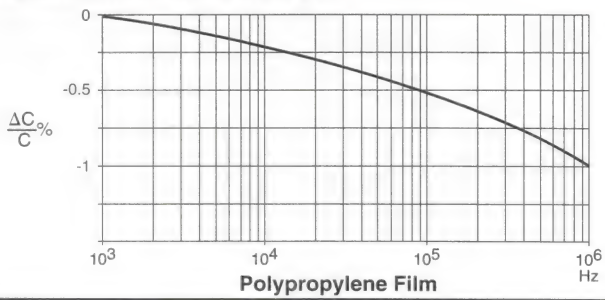
Typical Curves
Polyester and Polypropylene Film Capacitors

MALLORY

Capacitance Change as a function of Frequency (Room Temperature)

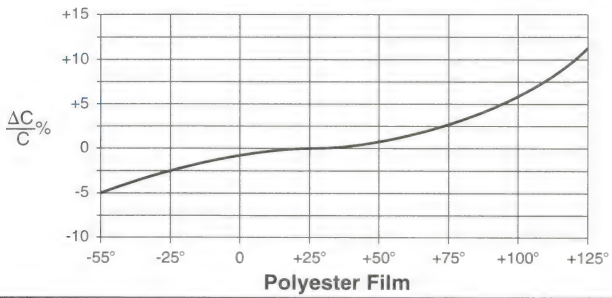


Polyester Film

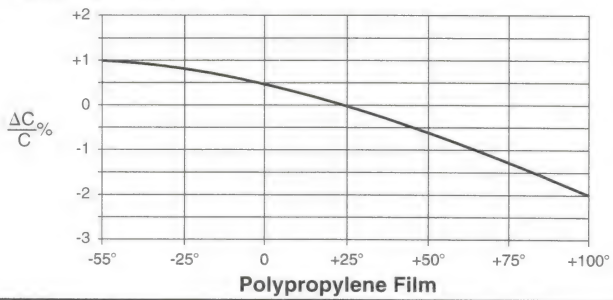


Polypropylene Film

Capacitance Variation as a function of Temperature @ 1KHz

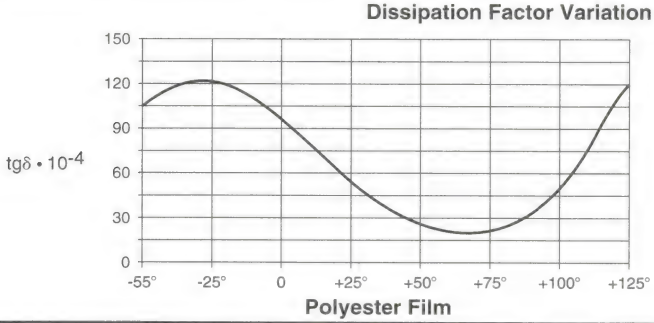


Polyester Film

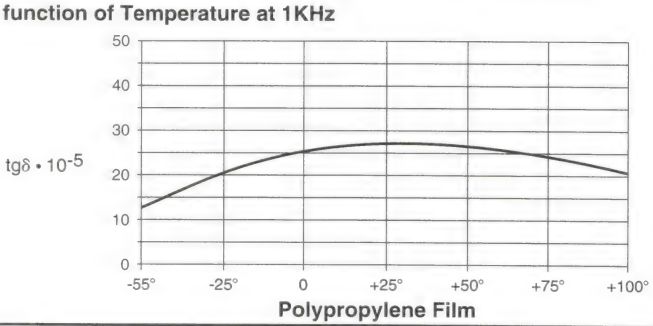


Polypropylene Film

Dissipation Factor Variation as a function of Temperature at 1KHz

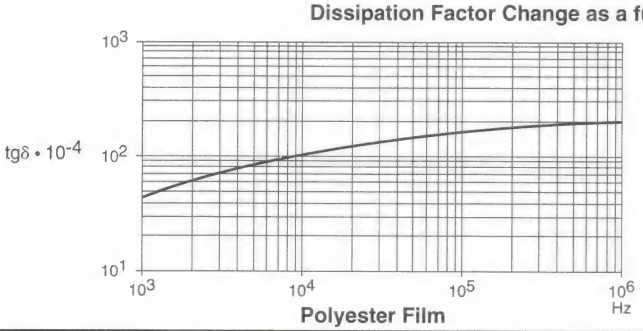


Polyester Film

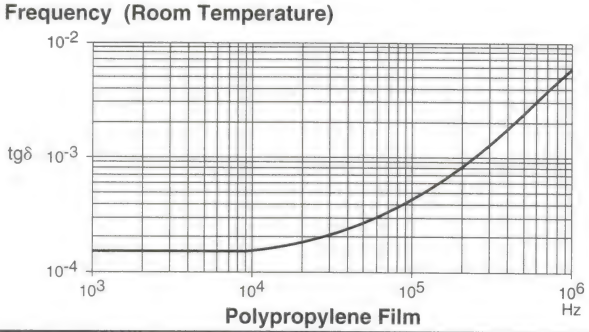


Polypropylene Film

Dissipation Factor Change as a function of Frequency (Room Temperature)

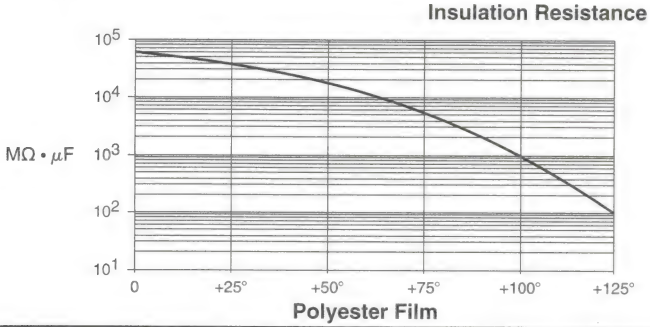


Polyester Film

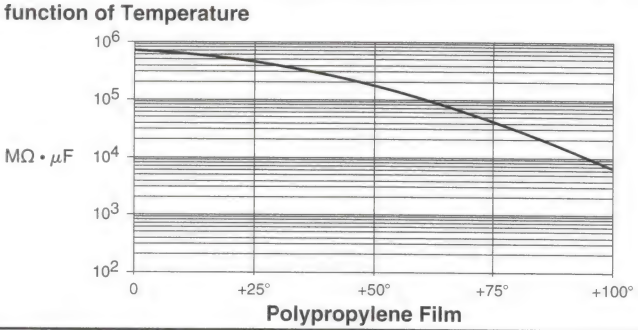


Polypropylene Film

Insulation Resistance as a function of Temperature



Polyester Film



Polypropylene Film

North American Capacitor Company7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

160 Series
Metallized Polyester / Radial Leads

MALLORY

- Radial Leaded (10 mm to 27.5 mm)
- Non Inductively Wound
- Non-Polar
- Flame Retardant Case Meets UL94V-0
- Epoxy Encapsulant Meets UL94V-0
- Lead Material Tinned Copper Clad Steel

Excellent choice for general purpose applications such as bypass, decoupling, smoothing and some timing, energy storage/ discharge and arc suppression.

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C with voltage derating above 85°C

Voltage Range:
63 VDC to 1000 VDC

Capacitance Range:
0.0022 μF to 10 μF

Capacitance Tolerance:
±5%, ±10%, ±20%

CECC Approval:
Detail Specification 30401-009

Total Self Inductance (L):

Pitch (mm)	10	15	22.5	27.5
L (nH) ≈	9	10	18	18

Dielectric Withstand Voltage:
1.6 x Rated Voltage for 2 sec at +25°C ±5°C

Dissipation Factor (DF):
tgδ x 10^{-4} at +25°C ±5°C

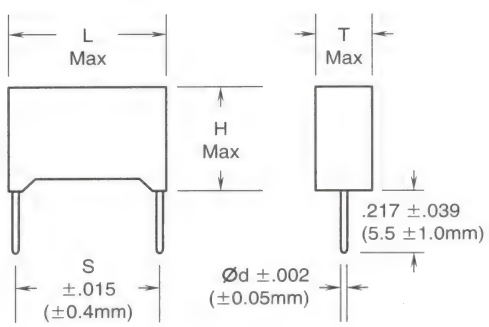
kHz	C ≤1μF	C >1μF
1	≤100	≤100
10	≤150	

Maximum Pulse Rise Time (dv/dt)

	(Pitch mm)			
Vn	10	15	22.5	27.5
63	3	1.5	1	1
100/160	6/8	3	2	1
250	11	7	4	3
400	20	10	5.5	5
630	30	15	8	7
1000	60	25	15	10

If the working voltage (V) is less than the nominal voltage (Vn), the capacitor can work at higher dv/dt. In this case, the maximum value allowed is obtained by multiplying the above value (See table dv/dt) with the ratio Vn/V.

Outline Dimensions



Note: The lead diameter is a maximum dimension for lead spacing ≤15mm and a nominal for lead spacing >15mm.

Test Method and Performance

Insulation Resistance	
Test Conditions	
Temperature	25°C ±5°C
Voltage Charge Time	1 minute
Voltage Charge	50 VDC for Vn < 100 VDC 100 VDC for Vn ≥ 100 VDC
Performance	
For Vn > 100 VDC	≥30,000 MΩ for C ≤ 0.33μF ≥10,000 MΩ x μF for C > 0.33μF
For Vn ≤ 100 VDC	≥10,000 MΩ for C ≤ 0.1μF ≥ 1,000 MΩ x μF for C > 0.1μF
Damp Heat Test	
Test Conditions	
Temperature	+40°C
Relative Humidity	95%
Test Duration	21 days
Performance	
Capacitance Change ΔC/C	≤ ± 5%
DF Change Δtgδ	≤ 50 x 10^{-4} at 1kHz
Insulation Resistance	≥ 50% of limit value
Life Test	
Test Conditions	
Temperature	+85°C
Test Duration	1000 hrs
Voltage Applied	1.25 x Vn
Performance	
Capacitance ChangeΔC/C	≤ ± 5%
DF Change Δtgδ	≤ 30 x 10^{-4} at 10kHz for C ≤ 1μF ≤ 20 x 10^{-4} at 1kHz for C > 1μF
Insulation Resistance	≥ 50% of limit value
Soldering	
Test Conditions	
Soldering Temperature	260°C ± 5°C
Soldering Duration	10 sec ± 1 sec
Performance	
Capacitance Change ΔC/C	≤ ± 2%
DF Change Δtgδ	≤ 30 x 10^{-4} at 10kHz for C ≤ 1μF ≤ 20 x 10^{-4} at 1kHz for C > 1μF
Long Term Stability (after two years)	
Storage	Standard Environmental Conditions
Performance	
Capacitance Change ΔC/C	≤ ± 3%
Corona (Partial Discharge Inception Voltage)	200 VAC for 100 VDC, 200 VDC 250 VAC for 400 VDC, 630 VDC, 300 VAC for 1000 VDC

160 Series
Metallized Polyester / Radial Leads

MALLORY

Catalog Number	Cap µF	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
63 VDC/40 VAC											
160224*63C	.22	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160274*63C	.27	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160334*63C	.33	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160394*63C	.39	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160474*63D	.47	.512	.197	.433	.394	.031	13	5	11	10	.8
160564*63D	.56	.512	.197	.433	.394	.031	13	5	11	10	.8
160684*63D	.68	.512	.197	.433	.394	.031	13	5	11	10	.8
160684*63F	.68	.709	.197	.433	.591	.031	18	5	11	15	.8
160824*63E	.82	.512	.236	.472	.394	.031	13	6	12	10	.8
160824*63F	.82	.709	.197	.433	.591	.031	18	5	11	15	.8
160105*63E	1.0	.512	.236	.472	.394	.031	13	6	12	10	.8
160105*63F	1.0	.709	.197	.433	.591	.031	18	5	11	15	.8
160155*63F	1.5	.709	.197	.433	.591	.031	18	5	11	15	.8
160225*63G	2.2	.709	.236	.472	.591	.031	18	6	12	15	.8
160335*63M	3.3	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8
160475*63N	4.7	1.043	.335	.669	.886	.031	26.5	8.5	17	22.5	.8
160685*63O	6.8	1.043	.394	.748	.886	.031	26.5	10	19	22.5	.8
160106*63P	10	1.260	.433	.787	1.083	.031	32	11	20	27.5	.8
100 VDC/63 VAC											
# 160104*100C	.10	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160124*100C	.12	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160154*100C	.15	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160184*100C	.18	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160224*100D	.22	.512	.197	.433	.394	.031	13	5	11	10	.8
160274*100D	.27	.512	.197	.433	.394	.031	13	5	11	10	.8
160334*100E	.33	.512	.236	.472	.394	.031	13	6	12	10	.8
160334*100F	.33	.709	.197	.433	.591	.031	18	5	11	15	.8
160394*100D	.39	.512	.197	.433	.394	.031	13	5	11	10	.8
160394*100F	.39	.709	.197	.433	.591	.031	18	5	11	15	.8
160474*100E	.47	.512	.236	.472	.394	.031	13	6	12	10	.8
160474*100F	.47	.709	.197	.433	.591	.031	18	5	11	15	.8
160564*100G	.56	.709	.236	.472	.591	.031	18	6	12	15	.8
160684*100G	.68	.709	.236	.472	.591	.031	18	6	12	15	.8
160824*100H	.82	.709	.295	.531	.591	.031	18	7.5	13.5	15	.8
160105*100H	1.0	.709	.295	.531	.591	.031	18	7.5	13.5	15	.8
160155*100M	1.5	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8
160225*100N	2.2	1.043	.335	.669	.886	.031	26.5	8.5	17	22.5	.8
160335*100O	3.3	1.043	.394	.748	.886	.031	26.5	10	19	22.5	.8
160475*100P	4.7	1.260	.433	.787	1.083	.031	32	11	20	27.5	.8
160685*100Q	6.8	1.260	.512	.886	1.083	.031	32	13	22.5	27.5	.8
160106*100S	10	1.457	.709	1.299	1.083	.031	32	18	33	27.5	.8
250 VDC/160 VAC											
160333*250C	.033	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160393*250C	.039	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160473*250C	.047	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160563*250C	.056	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160683*250C	.068	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160823*250D	.082	.512	.197	.433	.394	.031	13	5	11	10	.8
160104*250D	.10	.512	.197	.433	.394	.031	13	5	11	10	.8
160104*250F	.10	.709	.197	.433	.591	.031	18	5	11	15	.8
160124*250D	.12	.512	.197	.433	.394	.031	13	5	11	10	.8
160124*250F	.12	.709	.197	.433	.591	.031	18	5	11	15	.8
160154*250E	.15	.512	.236	.472	.394	.031	13	6	12	10	.8
160154*250F	.15	.709	.197	.433	.591	.031	18	5	11	15	.8
160184*250E	.18	.512	.236	.472	.394	.031	13	6	12	10	.8
160184*250F	.18	.709	.197	.433	.591	.031	18	5	11	15	.8
160224*250F	.22	.709	.197	.433	.591	.031	18	5	11	15	.8
160274*250G	.27	.709	.236	.472	.591	.031	18	6	12	15	.8
160334*250G	.33	.709	.236	.472	.591	.031	18	6	12	15	.8
160394*250H	.39	.709	.295	.531	.591	.031	18	7.5	13.5	15	.8
160474*250H	.47	.709	.295	.531	.591	.031	18	7.5	13.5	15	.8
160474*250L	.47	1.043	.236	.591	.886	.031	26.5	6	15	22.5	.8
160564*250I	.56	.709	.335	.571	.591	.031	18	8.5	14.5	15	.8
160564*250M	.56	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8
160684*250I	.68	.709	.335	.571	.591	.031	18	8.5	14.5	15	.8
160684*250M	.68	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8
160824*250M	.82	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8

* Indicate capacitance tolerance: J = ±5%, K = ±10%, M = ±20%
# Also available in 160 VDC

160 Series
Metallized Polyester / Radial Leads

MALLORY

Catalog Number	Cap µF	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
250 VDC/160 VAC											
160105*250N	1.0	1.043	.335	.669	.886	.031	26.5	8.5	17	22.5	.8
160155*250O	1.5	1.043	.394	.748	.886	.031	26.5	10	19	22.5	.8
160225*250P	2.2	1.260	.433	.787	1.083	.031	32	11	20	27.5	.8
160335*250Q	3.3	1.260	.512	.886	1.083	.031	32	13	22.5	27.5	.8
160475*250R	4.7	1.260	.591	1.181	1.083	.031	32	15	30	27.5	.8
160685*250S	6.8	1.457	.709	1.299	1.083	.031	32	18	33	27.5	.8
400 VDC/200 VAC											
160123*400C	.012	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160153*400C	.015	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160183*400C	.018	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160223*400C	.022	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160273*400C	.027	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160333*400D	.033	.512	.197	.433	.394	.031	13	5	11	10	.8
160393*400D	.039	.512	.197	.433	.394	.031	13	5	11	10	.8
160473*400E	.047	.512	.236	.472	.394	.031	13	6	12	10	.8
160473*400F	.047	.709	.197	.433	.591	.031	18	5	11	15	.8
160563*400F	.056	.709	.197	.433	.591	.031	18	5	11	15	.8
160683*400F	.068	.709	.197	.433	.591	.031	18	5	11	15	.8
160823*400F	.082	.709	.197	.433	.591	.031	18	5	11	15	.8
160104*400G	.10	.709	.236	.472	.591	.031	18	6	12	15	.8
160124*400G	.12	.709	.236	.472	.591	.031	18	6	12	15	.8
160154*400H	.15	.709	.295	.531	.591	.031	18	7.5	13.5	15	.8
160154*400L	.15	1.043	.236	.591	.886	.031	26.5	6	15	22.5	.8
160184*400L	.18	1.043	.236	.591	.886	.031	26.5	6	15	22.5	.8
160224*400L	.22	1.043	.236	.591	.886	.031	26.5	6	15	22.5	.8
160274*400M	.27	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8
160334*400M	.33	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8
160394*400N	.39	1.043	.335	.669	.886	.031	26.5	8.5	17	22.5	.8
160474*400N	.47	1.043	.335	.669	.886	.031	26.5	8.5	17	22.5	.8
160564*400O	.56	1.043	.394	.748	.886	.031	26.5	10	19	22.5	.8
160684*400P	.68	1.260	.433	.787	1.083	.031	32	11	20	27.5	.8
160824*400P	.82	1.260	.433	.787	1.083	.031	32	11	20	27.5	.8
160105*400P	1.0	1.260	.433	.787	1.083	.031	32	11	20	27.5	.8
160105*400Q	1.0	1.260	.512	.886	1.083	.031	32	13	22.5	27.5	.8
630 VDC/220 VAC											
160392*630C	.0039	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160472*630C	.0047	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160562*630C	.0056	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160682*630C	.0068	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160822*630C	.0082	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160103*630C	.010	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160123*630D	.012	.512	.197	.433	.394	.031	13	5	11	10	.8
160153*630D	.015	.512	.197	.433	.394	.031	13	5	11	10	.8
160183*630D	.018	.512	.197	.433	.394	.031	13	5	11	10	.8
160223*630E	.022	.512	.236	.472	.394	.031	13	6	12	10	.8
160273*630F	.027	.709	.197	.433	.591	.031	18	5	11	15	.8
160333*630F	.033	.709	.197	.433	.591	.031	18	5	11	15	.8
160393*630G	.039	.709	.236	.472	.591	.031	18	6	12	15	.8
160473*630G	.047	.709	.236	.472	.591	.031	18	6	12	15	.8
160563*630G	.056	.709	.236	.472	.591	.031	18	6	12	15	.8
160683*630H	.068	.709	.295	.531	.591	.031	18	7.5	13.5	15	.8
160683*630L	.068	1.043	.236	.591	.886	.031	26.5	6	15	22.5	.8
160823*630L	.082	1.043	.236	.591	.886	.031	26.5	6	15	22.5	.8
160104*630L	.10	1.043	.236	.591	.886	.031	26.5	6	15	22.5	.8
160124*630M	.12	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8
160154*630M	.15	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8
160184*630N	.18	1.043	.335	.669	.886	.031	26.5	8.5	17	22.5	.8
160224*630N	.22	1.043	.335	.669	.886	.031	26.5	8.5	17	22.5	.8
160274*630Q	.27	1.260	.512	.886	1.083	.031	32	13	22.5	27.5	.8
160334*630P	.33	1.260	.433	.787	1.083	.031	32	11	20	27.5	.8
160394*630P	.39	1.260	.433	.787	1.083	.031	32	11	20	27.5	.8
160474*630Q	.47	1.260	.512	.886	1.083	.031	32	13	22.5	27.5	.8

* Indicate capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

160 Series
Metallized Polyester / Radial Leads

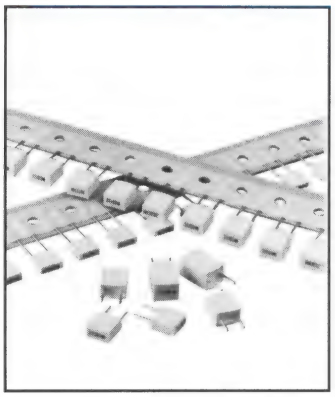
MALLORY

Catalog Number	Cap µF	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
1000 VDC/250 VAC											
160222*1000C	.0022	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160272*1000C	.0027	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160332*1000C	.0033	.512	.157	.374	.394	.031	13	4	9.5	10	.8
160392*1000D	.0039	.512	.197	.433	.394	.031	13	5	11	10	.8
160472*1000D	.0047	.512	.197	.433	.394	.031	13	5	11	10	.8
160562*1000D	.0056	.512	.197	.433	.394	.031	13	5	11	10	.8
160682*1000D	.0068	.512	.197	.433	.394	.031	13	5	11	10	.8
160822*1000D	.0082	.512	.197	.433	.394	.031	13	5	11	10	.8
160103*1000F	.010	.709	.197	.433	.591	.031	18	5	11	15	.8
160123*1000F	.012	.709	.197	.433	.591	.031	18	5	11	15	.8
160153*1000F	.015	.709	.197	.433	.591	.031	18	5	11	15	.8
160183*1000G	.018	.709	.236	.472	.591	.031	18	6	12	15	.8
160223*1000G	.022	.709	.236	.472	.591	.031	18	6	12	15	.8
160273*1000H	.027	.709	.295	.531	.591	.031	18	7.5	13.5	15	.8
160333*1000L	.033	1.043	.236	.591	.886	.031	26.5	6	15	22.5	.8
160393*1000L	.039	1.043	.236	.591	.886	.031	26.5	6	15	22.5	.8
160473*1000L	.047	1.043	.236	.591	.886	.031	26.5	6	15	22.5	.8
160563*1000M	.056	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8
160683*1000M	.068	1.043	.276	.630	.886	.031	26.5	7	16	22.5	.8
160823*1000N	.082	1.043	.335	.669	.886	.031	26.5	8.5	17	22.5	.8
160104*1000N	.10	1.043	.335	.669	.886	.031	26.5	8.5	17	22.5	.8
160124*1000O	.12	1.043	.394	.748	.886	.031	26.5	10	19	22.5	.8
160154*1000P	.15	1.260	.433	.787	1.083	.031	32	11	20	27.5	.8
160184*1000Q	.18	1.260	.512	.886	1.083	.031	32	13	22.5	27.5	.8
160224*1000Q	.22	1.260	.512	.886	1.083	.031	32	13	22.5	27.5	.8

* Indicate capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

167/184 Series
Metallized Polyester / Radial Leads

MALLORY



- Low Leakage
- Radial Leaded (7.5mm)
- 167 Series Bulk Packaging
- 184 Series Available Reel or Ammo Pack
- Non-Polar
- Flame Retardant Case Meets UL94V-0
- Epoxy Encapsulant Meets UL94V-0
- Lead Material
  Tinned Copper Wire
  Minimum Lead Content 5%

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C with voltage derating above 85°C

Voltage Range:
63 VDC to 630 VDC

Capacitance Range:
0.001 μF to 1.0 μF

Capacitance Tolerance:
±5%, ±10%, ±20%

CECC Approval:
Detail Specification 30401-009

Total Self Inductance:
Approximately 8nH

Dielectric Withstand Voltage:
1.6 x rated voltage for 2 sec at +25° C ±5° C

Dissipation Factor (DF):
tgδ x 10^{-4} at +25° C ±5° C

kHz	tgδ x 10^{-4}
1	≤100
10	≤150

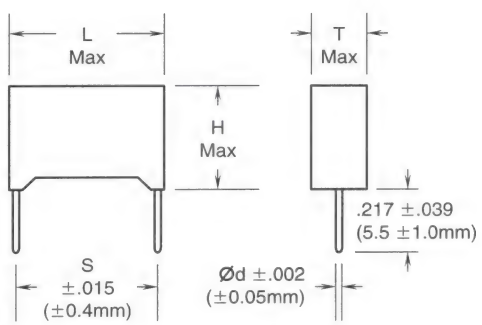
Excellent choice for general purpose applications such as bypass, decoupling, smoothing and some timing, energy storage/discharge and arc suppression.

Maximum Pulse Rise Time (dv/dt)

Vn	V/μ Sec
63	5
100	6
250	15
400	30
630	40

If the working voltage (V) is less than the nominal voltage (Vn), the capacitor can work at higher dv/dt. In this case, the maximum value allowed is obtained by multiplying the above value (See table dv/dt) with the ratio Vn/V.

Outline Dimensions



Lead Length shown as supplied on 167 Series

Test Method and Performance

Insulation Resistance	
Test Conditions	
Temperature	25° C ±5° C
Voltage Charge Time	1 minute
Voltage Charge	50 VDC for Vn < 100 VDC 100 VDC for Vn ≥ 100 VDC
Performance	
For Vn > 100 VDC	≥30,000 MΩ (50,000 MΩ typical)
For Vn ≤ 100 VDC	≥10,000 MΩ for C ≤ 0.1μF ≥ 1,000 MΩ x μF for C > 0.1μF
Damp Heat Test	
Test Conditions	
Temperature	+40°C
Relative Humidity	95%
Test Duration	21 days
Performance	
Capacitance Change ΔC/C	≤ ± 5%
DF Change Δtgδ	≤ 50 x 10^{-4} at 1kHz
Insulation Resistance	≥ 50% of limit value
Life Test	
Test Conditions	
Temperature	+85°C
Test Duration	1000 hrs
Voltage Applied	1.25 x Vn
Performance	
Capacitance ChangeΔC/C	≤ ± 5%
DF Change Δtgδ	≤ 30 x 10^{-4} at 10kHz
Insulation Resistance	≥ 50% of limit value
Soldering	
Test Conditions	
Soldering Temperature	260°C ± 5°C
Soldering Duration	10 sec ± 1 sec
Performance	
Capacitance Change ΔC/C	≤ ± 2%
DF Change Δtgδ	≤ 30 x 10^{-4} at 10kHz
Insulation Resistance	≥ limit value
Long Term Stability (after two years)	
Storage	Standard Environmental Conditions
Performance	
Capacitance Change ΔC/C	≤ ± 3%

167/184 Series
Metallized Polyester / Radial Leads

MALLORY

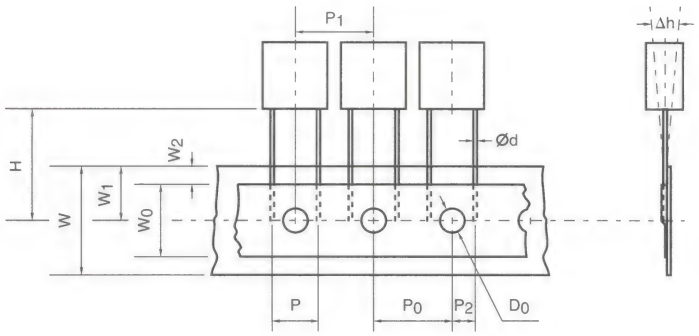
Catalog Number		Cap µF	Inches					Millimeters				
Bulk Pack	Tape and Reel Ammo Pack		L Length	T Thickness	H Height	S Spacing	Ød	L Length	T Thickness	H Height	S Spacing	Ød
63 VDC/40 VAC												
167683*63A	184683*63#A>	.068	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167104*63A	184104*63#A>	.10	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167154*63A	184154*63#A>	.15	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167224*63A	184224*63#A>	.22	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167274*63A	184274*63#A>	.27	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167334*63A	184334*63#A>	.33	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167474*63B	184474*63#B>	.47	.413	.157	.354	.295	.024	10.5	4.0	9.0	7.5	.6
167684*63C	184684*63#C>	.68	.413	.197	.433	.295	.024	10.5	5.0	11.0	7.5	.6
167105*63C	184105*63#C>	1	.413	.197	.433	.295	.024	10.5	5.0	11.0	7.5	.6
100 VDC/63 VAC												
167333*100A	184333*100#A>	.033	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167473*100A	184473*100#A>	.047	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167683*100A	184683*100#A>	.068	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167104*100A	184104*100#A>	.10	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167124*100B	184124*100#B>	.12	.413	.157	.354	.295	.024	10.5	4.0	9.0	7.5	.6
167154*100B	184154*100#B>	.15	.413	.157	.354	.295	.024	10.5	4.0	9.0	7.5	.6
167224*100C	184224*100#C>	.22	.413	.197	.433	.295	.024	10.5	5.0	11.0	7.5	.6
167334*100C	184334*100#C>	.33	.413	.197	.433	.295	.024	10.5	5.0	11.0	7.5	.6
250 VDC/160 VAC												
167103*250A	184103*250#A>	.01	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167153*250A	184153*250#A>	.015	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167183*250A	184183*250#A>	.018	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167223*250A	184223*250#A>	.022	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167273*250B	184273*250#B>	.027	.413	.157	.354	.295	.024	10.5	4.0	9.0	7.5	.6
167333*250B	184333*250#B>	.033	.413	.157	.354	.295	.024	10.5	4.0	9.0	7.5	.6
167393*250B	184393*250#B>	.039	.413	.157	.354	.295	.024	10.5	4.0	9.0	7.5	.6
167473*250B	184473*250#B>	.047	.413	.157	.354	.295	.024	10.5	4.0	9.0	7.5	.6
167683*250C	184683*250#C>	.068	.413	.197	.433	.295	.024	10.5	5.0	11.0	7.5	.6
167104*250C	184104*250#C>	.10	.413	.197	.433	.295	.024	10.5	5.0	11.0	7.5	.6
400 VDC/200 VAC												
167472*400A	184472*400#A>	.0047	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167562*400A	184562*400#A>	.0056	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167682*400A	184682*400#A>	.0068	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167103*400A	184103*400#A>	.01	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167153*400B	184153*400#B>	.015	.413	.157	.354	.295	.024	10.5	4.0	9.0	7.5	.6
167223*400C	184223*400#C>	.022	.413	.197	.433	.295	.024	10.5	5.0	11.0	7.5	.6
167333*400C	184333*400#C>	.033	.413	.197	.433	.295	.024	10.5	5.0	11.0	7.5	.6
630 VDC/220 VAC												
167102*630A	184102*630#A>	.001	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167152*630A	184152*630#A>	.0015	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167222*630A	184222*630#A>	.0022	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167332*630A	184332*630#A>	.0033	.413	.138	.276	.295	.024	10.5	3.5	7.0	7.5	.6
167472*630B	184472*630#B>	.0047	.413	.157	.354	.295	.024	10.5	4.0	9.0	7.5	.6
167682*630B	184682*630#B>	.0068	.413	.157	.354	.295	.024	10.5	4.0	9.0	7.5	.6
167103*630C	184103*630#C>	.01	.413	.197	.433	.295	.024	10.5	5.0	11.0	7.5	.6
167153*630D	184153*630#D>	.015	.413	.236	.472	.295	.024	10.5	6.0	12.0	7.5	.6

* Indicate capacitance tolerance:
J = ±5%, K = ±10%, M = ±20%

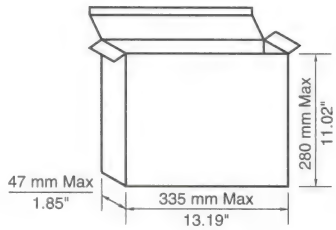
# Indicate packaging type:
R = Tape and Reel, A = Ammo Pack

> Indicate tooling code:
A = 16.5mm, B = 18.5mm, C = 16.0mm
(See H dimension in taping specifications)

Tape Specifications - 7.5 mm Lead Spacing



Reel Packing



Ammo Box Packing

Dimensions

Item	Code	Millimeters	Inches
Lead-Wire Diameter	Ød	$0.6^{+0.04-0.01}$	$.024^{\pm.001}$
Lead-to-Lead Distance	P	$7.5^{+0.6-0.2}$	$.295^{+.024-.040}$
Feed Hole Pitch	p_0	$12.7^{\pm0.3}$	$.5^{\pm.012}$
Pitch of Component	p_1	$12.7^{\pm1.0}$	$.5^{\pm.039}$
Hole Center to Lead	p_2	$8.95^{\pm0.7}$	$.352^{\pm.028}$
Component Alignment, F-R	Δh	$0^{\pm2.0}$	$0^{\pm.079}$
Tape Width	W	$18^{+1.0-0.1}$	$.709^{+.039-.004}$
Hold-down Tape Width	W_0	6.0 min	.236 min
Hole Position	W_1	$9.0^{+0.75-0.05}$	$.355^{+.030-.001}$
Hold-down Tape Position	W_2	3.0 Max	.118 Max
Height of Component from Tape Center	H	>	>
Feed Hole Diameter	D_0	$4.0^{\pm0.3}$	$.157^{\pm.012}$

Component Quantity Per Reel

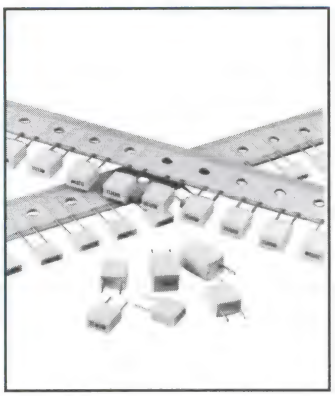
Case Code	Quantity Reeled	Quantity Ammo Pack
A	1800	1500
B	1500	1500
C	1200	1000
D	1000	1000

> The H dimension depends on the insertion equipment used. Specify the proper tooling code as indicated below.

Tooling Code	H Dimension	
	Millimeters	Inches
A	$16.5^{\pm0.75}$	$.679^{\pm.030}$
B	$18.5^{\pm0.75}$	$.728^{\pm.030}$
C	$16.0^{\pm0.75}$	$.630^{\pm.030}$

168/185 Series
Metallized Polyester / Radial Leads

MALLORY



- Low Leakage
- Radial Leaded (5.0mm)
- 168 Series Bulk Packaging
- 185 Series Available Reel or Ammo Pack
- Non-Polar
- Flame Retardant Case Meets UL94V-0
- Epoxy Encapsulant Meets UL94V-0
- Lead Material
  Tinned Copper Wire
  Minimum Lead Content 5%

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C with voltage derating above 85°C

Voltage Range:
50 VDC to 400 VDC

Capacitance Range:
0.0010 μF to 1.0 μF

Capacitance Tolerance:
±5%, ±10%, ±20%

CECC Approval:
Detail Specification 30401-009

Total Self Inductance:
Approximately 7nH

Dielectric Withstand Voltage:
1.6 x rated voltage for 2 sec at +25°C ±5°C

Dissipation Factor (DF):
tgδ x 10^{-4} at +25°C ±5°C

kHz	C≤0.1μF	C>0.1μF
1	≤100	≤100
10	≤150	≤150
100	≤300	

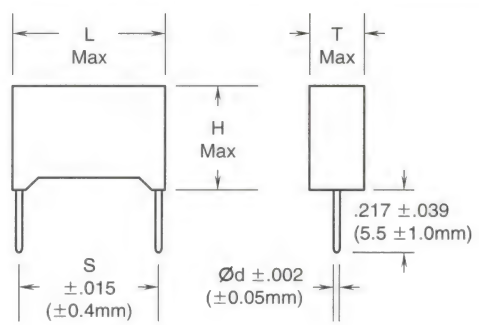
Excellent choice for general purpose applications such as bypass, decoupling, smoothing and some timing, energy storage/discharge and arc suppression.

Maximum Pulse Rise Time (dv/dt)

Vn	Capacitance	V/μ Sec
50		4
63		8
100	C > .0068μF	10
	.0033μF < C < .0068μF	15
	C ≤ .0033μF	30
250		44
400		100

If the working voltage (V) is less than the nominal voltage (Vn), the capacitor can work at higher dv/dt. In this case, the maximum value allowed is obtained by multiplying the above value (See table dv/dt) with the ratio Vn/V.

Outline Dimensions



Lead Length shown is as supplied on 168 Series

Test Method and Performance

Insulation Resistance	
Test Conditions	
Temperature	25°C ±5°C
Voltage Charge Time	1 minute
Voltage Charge	50 VDC for Vn < 100 VDC 100 VDC for Vn ≥ 100 VDC
Performance	
For Vn > 100 VDC	≥30,000 MΩ
For Vn ≤ 100 VDC	≥10,000 MΩ for C ≤ 0.1μF ≥ 1,000 MΩ x μF for C > 0.1μF
Damp Heat Test	
Test Conditions	
Temperature	+40°C
Relative Humidity	95%
Test Duration	21 days
Performance	
Capacitance Change ΔC/C	≤ ± 5%
DF Change Δtgδ	≤ 50 x 10^{4} at 1kHz
Insulation Resistance	≥ 50% of limit value
Life Test	
Test Conditions	
Temperature	+85°C
Test Duration	1000 hrs
Voltage Applied	1.25 x Vn
Performance	
Capacitance ChangeΔC/C	≤ ± 5%
DF Change Δtgδ	≤ 30 x 10^{-4} at 10kHz
Insulation Resistance	≥ 50% of limit value
Soldering	
Test Conditions	
Soldering Temperature	260°C ± 5°C
Soldering Duration	10 sec ± 1 sec
Performance	
Capacitance Change ΔC/C	≤ ± 2%
DF Change Δtgδ	≤ 30 x 10^{-4} at 10kHz
Insulation Resistance	≥ limit value
Long Term Stability (after two years)	
Storage	Standard Environmental Conditions
Performance	
Capacitance Change ΔC/C	≤ ± 3%

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

MALLORY

Catalog Number		Cap µF	Inches					Millimeters				
Bulk Pack	Tape and Reel Ammo Pack		L Length	T Thickness	H Height	S Spacing	Ød	L Length	T Thickness	H Height	S Spacing	Ød
50 VDC/30 VAC												
168104*50A	185104*50#A>	.10	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168154*50A	185154*50#A>	.15	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168224*50C	185224*50#C>	.22	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168334*50C	185334*50#C>	.33	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168474*50H	185474*50#H>	.47	.283	.177	.335	.197	.024	7.2	4.5	8.5	5.0	.6
168684*50F	185684*50#F>	.68	.283	.197	.394	.197	.024	7.2	5.0	10.0	5.0	.6
168824*50G	185824*50#G>	.82	.283	.236	.433	.197	.024	7.2	6.0	11.0	5.0	.6
168105*50G	185105*50#G>	1	.283	.236	.433	.197	.024	7.2	6.0	11.0	5.0	.6
63 VDC/40 VAC												
168473*63A	185473*63#A>	.047	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168563*63A	185563*63#A>	.056	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168683*63A	185683*63#A>	.068	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168823*63A	185823*63#A>	.082	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168104*63A	185104*63#A>	.10	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168154*63C	185154*63#C>	.15	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168184*63C	185184*63#C>	.18	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168224*63C	185224*63#C>	.22	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168274*63C	185274*63#C>	.27	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168334*63H	185334*63#H>	.33	.283	.177	.335	.197	.024	7.2	4.5	8.5	5.0	.6
168474*63H	185474*63#H>	.47	.283	.177	.335	.197	.024	7.2	4.5	8.5	5.0	.6
168684*63F	185684*63#F>	.68	.283	.197	.394	.197	.024	7.2	5.0	10.0	5.0	.6
168105*63G	185105*63#G>	1	.283	.236	.433	.197	.024	7.2	6.0	11.0	5.0	.6
100 VDC/63 VAC												
168102*100A	185102*100#A>	.001	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168152*100A	185152*100#A>	.0015	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168222*100A	185222*100#A>	.0022	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168272*100A	185272*100#A>	.0027	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168332*100A	185332*100#A>	.0033	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168392*100A	185392*100#A>	.0039	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168472*100A	185472*100#A>	.0047	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168562*100A	185562*100#A>	.0056	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168682*100A	185682*100#A>	.0068	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168822*100A	185822*100#A>	.0082	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168103*100A	185103*100#A>	.010	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168153*100A	185153*100#A>	.015	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168183*100A	185183*100#A>	.018	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168223*100A	185223*100#A>	.022	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168273*100A	185273*100#A>	.027	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168333*100C	185333*100#C>	.033	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168393*100C	185393*100#C>	.039	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168473*100C	185473*100#C>	.047	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168683*100H	185683*100#H>	.068	.283	.177	.335	.197	.024	7.2	4.5	8.5	5.0	.6
168104*100H	185104*100#H>	.10	.283	.177	.335	.197	.024	7.2	4.5	8.5	5.0	.6
168154*100F	185154*100#F>	.15	.283	.197	.394	.197	.024	7.2	5.0	10.0	5.0	.6
168224*100G	185224*100#G>	.22	.283	.236	.433	.197	.024	7.2	6.0	11.0	5.0	.6
250 VDC/160 VAC												
168332*250A	185332*250#A>	.0033	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168472*250A	185472*250#A>	.0047	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168682*250A	185682*250#A>	.0068	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168103*250A	185103*250#A>	.010	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168153*250A	185153*250#A>	.015	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168223*250C	185223*250#C>	.022	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168333*250C	185333*250#C>	.033	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168473*250F	185473*250#F>	.047	.283	.197	.394	.197	.024	7.2	5.0	10.0	5.0	.6
168683*250F	185683*250#F>	.068	.283	.197	.394	.197	.024	7.2	5.0	10.0	5.0	.6
168104*250G	185104*250#G>	.10	.283	.236	.433	.197	.024	7.2	6.0	11.0	5.0	.6

* Indicate capacitance tolerance:
J = ±5%, K = ±10%, M = ±20%

# Indicate packaging type:
R = Tape and Reel, A = Ammo Pack

> Indicate tooling code:
A = 16.5mm, B = 18.5mm, C = 16.0mm
(See H dimension in taping specifications)

168/185 Series
Metallized Polyester / Radial Leads

MALLORY

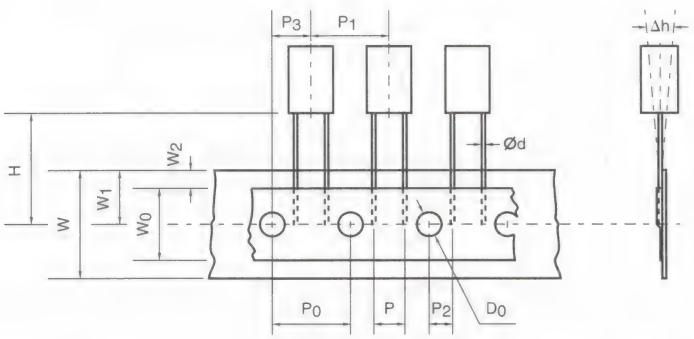
Catalog Number		Cap µF	Inches					Millimeters				
Bulk Pack	Tape and Reel Ammo Pack		L Length	T Thickness	H Height	S Spacing	Ød	L Length	T Thickness	H Height	S Spacing	Ød
400 VDC/200 VAC												
168102*400A	185102*400#A>	.0010	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168152*400A	185152*400#A>	.0015	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168222*400A	185222*400#A>	.0022	.283	.098	.256	.197	.024	7.2	2.5	6.5	5.0	.6
168332*400C	185332*400#C>	.0033	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168472*400C	185472*400#C>	.0047	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168682*400C	185682*400#C>	.0068	.283	.138	.295	.197	.024	7.2	3.5	7.5	5.0	.6
168103*400F	185103*400#F>	.010	.283	.197	.394	.197	.024	7.2	5.0	10.0	5.0	.6
168153*400F	185153*400#F>	.015	.283	.197	.394	.197	.024	7.2	5.0	10.0	5.0	.6
168223*400G	185223*400#G>	.022	.283	.236	.433	.197	.024	7.2	6.0	11.0	5.0	.6

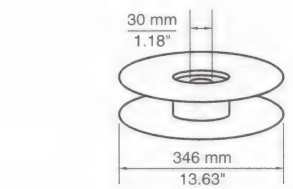
* Indicate capacitance tolerance:
J = ±5%, K = ±10%, M = ±20%

# Indicate packaging type:
R = tape and reel, A = ammo pack

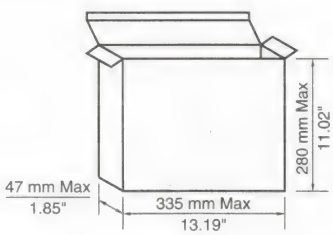
> Indicate tooling code:
A = 16.5mm, B = 18.5mm, C = 16.0mm
(See H dimension in taping specifications)

Tape Specifications - 5.0 mm Lead Spacing





Reel Packing



Ammo Box Packing

Dimensions

Item	Code	Millimeters	Inches
Lead-Wire Diameter	Ød	$0.6^{+0.04-0.01}$	$.024^{\pm.001}$
Lead-to-Lead Distance	P	$5.0^{+0.6-0.2}$	$.197^{+.024-.040}$
Feed Hole Pitch	p_0	$12.7^{\pm0.3}$	$.5^{\pm.012}$
Pitch of Component	p_1	$12.7^{\pm1.0}$	$.5^{\pm.039}$
Hole Center to Lead	p_2	$3.85^{\pm0.7}$	$.152^{\pm.028}$
Feed Hole Center to Component Center	p_3	$6.35^{\pm1.3}$	$.250^{\pm.051}$
Component Alignment, F-R	Δh	$0^{\pm2.0}$	$0^{\pm.079}$
Tape Width	W	$18^{+1.0-0.1}$	$.709^{+.039-.004}$
Hold-Down Tape Width	W_0	6.0 min	.236 min
Hole Position	W_1	$9.0^{+0.75-0.05}$	$.355^{+.030-.001}$
Hold-Down Tape Position	W_2	3.0 Max	.118 Max
Height of Component from Tape Center	H	>	>
Feed Hole Diameter	D_0	$4.0^{\pm0.3}$	$.157^{\pm.012}$

Component Quantity Per Reel

Case Code	Quantity Reeled	Quantity Ammo Pack
A	2500	3500
C	1800	1500
F	1200	1200
G	1000	1000
H	1400	1400

> The H dimension depends on the insertion equipment used. Specify the proper tooling code as indicated below.

Tooling Code	H Dimension	
	Millimeters	Inches
A	$16.5^{\pm0.75}$	$.679^{\pm.030}$
B	$18.5^{\pm0.75}$	$.728^{\pm.030}$
C	$16.0^{\pm0.75}$	$.630^{\pm.030}$

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

171 Series
Metallized Polypropylene / Radial Leads

MALLORY

- Low Leakage
- Radial Leaded (7.5 mm to 27.5 mm)
- Non Inductively Wound
- Non-Polar
- Flame Retardant Case Meets UL94V-0
- Epoxy Encapsulant Meets UL94V-0
- Lead Material Tinned Copper Wire Minimum Lead Content 5%

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +105°C with voltage derating above 85°C

Voltage Range:
160 VDC (90 VAC) to 630 VDC (250 VAC)

Capacitance Range:
0.0022 µF to 3.3 µF

Capacitance Tolerance:
±5%, ±10%, ±20%

Total Self Inductance (2mm lead length)

pitch (mm)	7.5	10	15	22.5	27.5
L (nH) ≈	8	9	10	18	18

Dielectric Withstand Voltage:
1.6 x Rated Voltage for 2 sec at +25°C ±5°C

Dissipation Factor (DF):
tgδ x 10^{-4} at +25°C ±5°C

kHz	C ≤0.1µF	C 0.1µF to 1µF	C >1µF
1	≤6	≤6	≤6
10	≤10	≤20	
100	≤30		

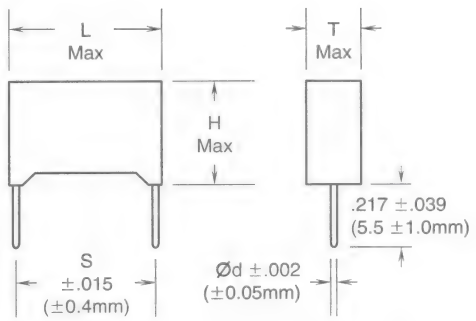
Excellent choice for applications requiring low dielectric losses, high insulation resistance, high voltage capability and stable characteristics.

Maximum Pulse Rise Time dv/dt (V/µsec)

Vn	Pitch (mm) 7.5	10	15	22.5	27.5
160	5.5	4	2	1.5	1
250	15	11	7	4	3
400	35	20	10	5.5	5
630	55	30	15	8	7

If the working voltage (V) is less than the nominal voltage (Vn), the capacitor can work at higher dv/dt. In this case, the maximum value allowed is obtained by multiplying the above value (See table dv/dt) with the ratio Vn/V.

Outline Dimensions



Lead Length shown is as supplied on 171 Series

Test Method and Performance

Insulation Resistance	
Test Conditions	
Temperature	+25°C ± 5°C
Voltage Charge Time	1 minute
Voltage Charge	100VDC
Performance	
For C ≤ 0.33 µF	≥100,000 MΩ
For C > 0.33 µF	≥30,000 MΩ x µF
Damp Heat Test	
Test Conditions	
Temperature	+40°C
Relative Humidity	93% ± 2%
Test Duration	56 days
Performance	
Capacitance Change ΔC/C	≤ ± 2%
DF Change Δtgδ	≤ 10 x 10^{-4} at 1 kHz
Insulation Resistance	≥ 50% of limit value
Life Test	
Test Conditions	
Temperature	+85°C
Test Duration	2000 hrs
Voltage Applied	1.25 x Vn
Performance	
Capacitance Change ΔC/C	≤ ± 3%
DF Change Δtgδ	≤ 10 x 10^{-4} for C > 1µF at 1 kHz ≤10 x 10^{-4} for C ≤ 1µF at 10 kHz
Insulation Resistance	≥ 50% of limit value
Soldering	
Test Conditions	
Soldering Temperature	+260°C ± 5°C
Soldering Duration	10 sec ± 1 sec
Performance	
Capacitance ChangeΔC/C	≤ ± 1%
DF Change Δtgδ	≤ 10 x 10^{-4} for C > 1µF at 1 kHz ≤ 10 x 10^{-4} for C ≤ 1µF at 10 kHz
Long Term Stability (after two years)	
Storage	Standard Environmental Conditions
Performance	
Capacitance Change ΔC/C	≤ ± 0.5%
Corona (Partial Discharge Inception Voltage)	200 VAC for 160 VDC, 250 VDC 250 VAC for 400 VDC, 630 VDC

Catalog Number	Cap µF	Inches (Max) L Length	T Thickness	H Height	S Spacing	Ød	Millimeters (Max) L Length	T Thickness	H Height	S Spacing	Ød	ESR (mOhms) 20kHz to 100kHz	IRMS 25°C	45°C	85°C
160 VDC/90 VAC															
171333*160B	.033	.413	.157	.374	.295	.024	10.5	4.0	9.5	7.5	.6				
171473*160B	.047	.413	.157	.374	.295	.024	10.5	4.0	9.5	7.5	.6				
171473*160C	.047	.512	.157	.374	.394	.031	13.0	4.0	9.5	10.0	.8				
171683*160C7	.068	.413	.197	.433	.295	.031	10.5	5.0	11.0	7.5	.8				
171683*160D	.068	.512	.197	.433	.394	.031	13.0	5.0	11.0	10.0	.8				
171104*160C7	.10	.413	.197	.433	.295	.031	10.5	5.0	11.0	7.5	.8				
171104*160E	.10	.512	.236	.472	.394	.031	13.0	6.0	12.0	10.0	.8				

Not applicable. These capacitance values are not customarily used in switched-mode power supplies.

* Indicate capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

171 Series
Metallized Polypropylene / Radial Leads

MALLORY

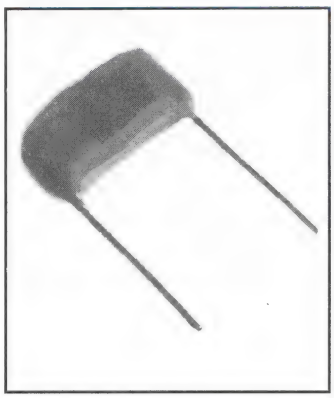
Catalog Number	Cap µF	Inches (Max)					Millimeters (Max)					ESR (mOhms) 20kHz to 100KHz	IRMS		
		L Length	T Thickness	H Height	S Spacing	Ød	L Length	T Thickness	H Height	S Spacing	Ød		25°C	45°C	85°C
160 VDC/90 VAC															
171154*160D7	.15	.413	.236	.472	.295	.031	10.5	6.0	12.0	7.5	.8	Not applicable. These capacitance values are not customarily used in switched-mode power supplies.			
171154*160E	.15	.512	.236	.472	.394	.031	13.0	6.0	12.0	10.0	.8				
171224*160F	.22	.709	.197	.433	.591	.031	18.0	5.0	11.0	15.0	.8				
171334*160G	.33	.709	.236	.472	.591	.031	18.0	6.0	12.0	15.0	.8				
171474*160H	.47	.709	.295	.531	.591	.031	18.0	7.5	13.5	15.0	.8	37	3.7	3.1	1.4
171684*160L	.68	1.043	.236	.591	.886	.031	26.5	6.0	15.0	22.5	.8	33	4.1	3.5	1.6
171105*160N	1.0	1.043	.335	.669	.886	.031	26.5	8.5	17.0	22.5	.8	26	5.5	4.7	2.6
171155*160O	1.5	1.043	.394	.748	.886	.031	26.5	10.0	19.0	22.5	.8	20	6.1	5.1	3.1
171225*160P	2.2	1.260	.433	.787	1.083	.031	32.0	11.0	20.0	27.5	.8	18	6.3	5.7	3.3
171335*160Q	3.3	1.260	.512	.886	1.083	.031	32.0	13.0	22.5	27.5	.8	16	7.4	6.4	3.6
250 VDC/200 VAC															
171153*250B	.015	.413	.157	.374	.295	.024	10.5	4.0	9.5	7.5	.6	Not applicable. These capacitance values are not customarily used in switched-mode power supplies.			
171223*250B	.022	.413	.157	.374	.295	.024	10.5	4.0	9.5	7.5	.6				
171223*250C	.022	.512	.157	.374	.394	.031	13.0	4.0	9.5	10.0	.8				
171333*250C	.033	.512	.157	.374	.394	.031	13.0	4.0	9.5	10.0	.8				
171473*250D	.047	.512	.197	.433	.394	.031	13.0	5.0	11.0	10.0	.8				
171683*250E	.068	.512	.236	.472	.394	.031	13.0	6.0	12.0	10.0	.8				
171104*250F	.10	.709	.197	.433	.591	.031	18.0	5.0	11.0	15.0	.8				
171154*250G	.15	.709	.236	.472	.591	.031	18.0	6.0	12.0	15.0	.8				
171224*250H	.22	.709	.295	.531	.591	.031	18.0	7.5	13.5	15.0	.8				
171334*250L	.33	1.043	.236	.591	.886	.031	26.5	6.0	15.0	22.5	.8				
171474*250M	.47	1.043	.276	.630	.886	.031	26.5	7.0	16.0	22.5	.8	35	3.8	3.6	1.7
171684*250Q	.68	1.260	.512	.886	1.083	.031	32.0	13.0	22.5	27.5	.8	32	4.0	3.8	1.9
171105*250P	1.0	1.260	.433	.787	1.083	.031	32.0	11.0	20.0	27.5	.8	28	4.4	4.4	3.2
171155*250Q	1.5	1.260	.512	.886	1.083	.031	32.0	13.0	22.5	27.5	.8	26	5.1	4.9	3.5
400 VDC/220 VAC															
171682*400B	.0068	.413	.157	.374	.295	.024	10.5	4.0	9.5	7.5	.6	Not applicable. These capacitance values are not customarily used in switched-mode power supplies.			
171103*400B	.01	.413	.157	.374	.295	.024	10.5	4.0	9.5	7.5	.6				
171103*400C	.01	.512	.157	.374	.394	.031	13.0	4.0	9.5	10.0	.8				
171153*400D	.015	.512	.197	.433	.394	.031	13.0	5.0	11.0	10.0	.8				
171223*400D	.022	.512	.197	.433	.394	.031	13.0	5.0	11.0	10.0	.8				
171333*400E	.033	.512	.236	.472	.394	.031	13.0	6.0	12.0	10.0	.8				
171473*400F	.047	.709	.197	.433	.591	.031	18.0	5.0	11.0	15.0	.8				
171683*400G	.068	.709	.236	.472	.591	.031	18.0	6.0	12.0	15.0	.8				
171104*400H	.10	.709	.295	.531	.591	.031	18.0	7.5	13.5	15.0	.8				
171154*400I	.15	.709	.335	.571	.591	.031	18.0	8.5	14.5	15.0	.8				
171224*400N	.22	1.043	.335	.669	.886	.031	26.5	8.5	17.0	22.5	.8				
171334*400O	.33	1.043	.394	.748	.886	.031	26.5	10.0	19.0	22.5	.8				
171474*400P	.47	1.260	.433	.787	1.083	.031	32.0	11.0	20.0	27.5	.8	32	5.7	5.0	2.2
171684*400Q	.68	1.260	.512	.886	1.083	.031	32.0	13.0	22.5	27.5	.8	30	5.7	5.5	2.4
630 VDC/250 VAC															
171222*630B	.0022	.413	.157	.374	.295	.024	10.5	4.0	9.5	7.5	.6	Not applicable. These capacitance values are not customarily used in switched-mode power supplies.			
171222*630C	.0022	.512	.157	.374	.394	.031	13.0	4.0	9.5	10.0	.8				
171332*630B	.0033	.413	.157	.374	.295	.024	10.5	4.0	9.5	7.5	.6				
171332*630C	.0033	.512	.157	.374	.394	.031	13.0	4.0	9.5	10.0	.8				
171472*630B	.0047	.413	.157	.374	.295	.024	10.5	4.0	9.5	7.5	.6				
171472*630C	.0047	.512	.157	.374	.394	.031	13.0	4.0	9.5	10.0	.8				
171682*630D	.0068	.512	.197	.433	.394	.031	13.0	5.0	11.0	10.0	.8				
171103*630D	.01	.512	.197	.433	.394	.031	13.0	5.0	11.0	10.0	.8				
171153*630E	.015	.512	.236	.472	.394	.031	13.0	6.0	12.0	10.0	.8				
171223*630F	.022	.709	.197	.433	.591	.031	18.0	5.0	11.0	15.0	.8				
171333*630G	.033	.709	.236	.472	.591	.031	18.0	6.0	12.0	15.0	.8				
171473*630H	.047	.709	.295	.531	.591	.031	18.0	7.5	13.5	15.0	.8				
171683*630I	.068	.709	.335	.571	.591	.031	18.0	8.5	14.5	15.0	.8				
171104*630N	.10	1.043	.335	.669	.886	.031	26.5	8.5	17.0	22.5	.8				
171154*630O	.15	1.043	.394	.748	.886	.031	26.5	10.0	19.0	22.5	.8				
171224*630P	.22	1.260	.433	.787	1.083	.031	32.0	11.0	20.0	27.5	.8				
171334*630Q	.33	1.260	.512	.886	1.083	.031	32.0	13.0	22.5	27.5	.8				

* Indicate capacitance tolerance
J = ±5%
K = ±10%
M = ±20%

DMF Series
Metallized Polyester / Radial Leads

NEW

MALLORY



- Radial Leaded (7.5 mm to 42.5 mm)
- Non Inductively Wound
- Non-Polar
- Flame Retardant Epoxy Powder
- Coating Meets UL94V-0
- Lead Material Tinned Copper Clad Steel

Excellent choice for general purpose applications such as bypass, decoupling, smoothing and some timing, energy storage/ discharge and arc suppression.

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +100°C with voltage derating above 85°C

Voltage Range:
63 VDC to 630 VDC

Capacitance Range:
0.01 μF to 10 μF

Capacitance Tolerance:
±5%, ±10%, ±20%

Dielectric Withstand Voltage:
1.6 x Rated Voltage for 2 sec at +25°C ±5°C

Dissipation Factor (DF):
tgδ x 10^{-4} at +25°C ±5°C

kHz	C ≤.1μF	.1<C ≤1μF	C≥1
1	≤80	≤80	≤100
10	≤150	≤150	≤180

Total Self Inductance (L):

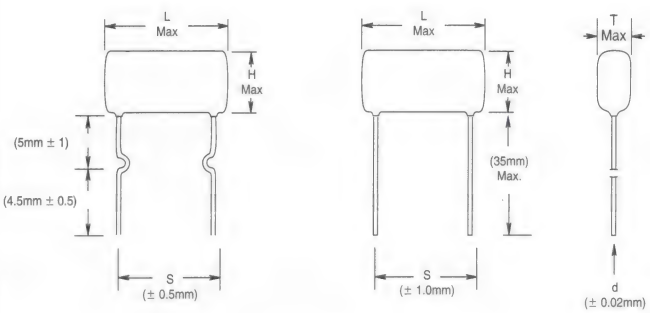
Pitch (mm)	7.5	10	15	20	27.5	32.5	37.5
L (nH) ≈	6	9	10	17	18	22	23

Maximum Pulse Rise Time (dv/dt)

	(Pitch mm)						
Vn	7.5	10	15	20	27.5	32.5	37.5
63V	4	3	1.5				
100V	7	6	3	2	1		
250V	12	11	7	4	3	2	1
400V	23	20	10	5.5	5	4	2
630V	35	30	15	8	7	5	3

If the working voltage (V) is less than the nominal voltage (Vn), the capacitor can work at higher dv/dt. In this case, the maximum value allowed is obtained by multiplying the above value (See table dv/dt) with the ratio Vn/V.

Outline Dimensions



Test Method and Performance

Insulation Resistance	
Test Conditions	
Temperature	25°C ±5°C
Voltage Charge Time	1 minute
Voltage Charge	100 VDC
Performance	
for C ≤.33 μF	>30,000 MΩ
for C > .33 μF	>10,000 MΩ

Damp Heat Test	
Test Conditions	
Temperature	+40°C
Relative Humidity	95%
Test Duration	46 days
Performance	
Capacitance Change ΔC/C	≤ ± 5%
DF Change Δtgδ	≤ 50 x 10^{-4} at 1kHz
Insulation Resistance	≥ 50% of limit value

Life Test	
Test Conditions	
Temperature	+85°C
Test Duration	2000 hrs
Voltage Applied	1.25 x Vn
Performance	
Capacitance ChangeΔC/C	≤ ± 5%
DF Change Δtgδ	≤ 30 x 10^{-4} at 1kHz
Insulation Resistance	≥ 50% of limit value

Soldering	
Test Conditions	
Soldering Temperature	260°C ± 5°C
Soldering Duration	10 sec ± 1 sec
Performance	
Capacitance Change ΔC/C	≤ ± 1%
DF Change Δtgδ	≥30 x 10^{-4} at 1kHz

Long Term Stability (after two years)	
Storage	Standard Environmental Conditions
Performance	
Capacitance Change ΔC/C	≤ ± 3%

DMF Series
Metallized Polyester / Radial Leads

NEW

MALLORY

Catalog Number	Cap µF	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
63 VDC/40 VAC											
DMF103*063A	.01	.413	.217	.354	.295	.024	10.5	5.5	9.0	7.5	.6
DMF153*063A	.015	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF223*063A	.022	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF333*063A	.033	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF473*063A	.047	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF683*063A	.068	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF104*063A	.1	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF154*063A	.15	.413	.276	.413	.295	.024	10.5	7.0	10.5	7.5	.6
DMF224*063A	.22	.413	.276	.413	.295	.024	10.5	7.0	10.5	7.5	.6
DMF334*063A	.33	.413	.315	.433	.295	.024	10.5	8.0	11.0	7.5	.6
DMF474*063A	.47	.413	.315	.453	.295	.024	10.5	8.0	11.5	7.5	.6
DMF684*063B	.68	.512	.276	.453	.394	.024	13.0	7.0	11.5	10.0	.6
DMF105*063B	1.0	.512	.276	.492	.394	.024	13.0	7.0	12.5	10.0	.6
DMF155*063C	1.5	.728	.315	.551	.591	.031	18.5	8.0	14.0	15.0	.8
DMF225*063C	2.2	.728	.394	.591	.591	.031	18.5	10.0	15.0	15.0	.8
100 VDC/63 VAC											
DMF103*100A	.01	.394	.217	.354	.295	.024	10.0	5.5	9.0	7.5	.6
DMF153*100A	.015	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF223*100A	.022	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF333*100A	.033	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF473*100A	.047	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF683*100A	.068	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF104*100A	.1	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF154*100B	.15	.512	.217	.354	.394	.024	13.0	5.5	9.0	10.0	.6
DMF224*100B	.22	.512	.256	.394	.394	.024	13.0	6.5	10.0	10.0	.6
DMF334*100B	.33	.512	.315	.453	.394	.024	13.0	8.0	11.5	10.0	.6
DMF474*100C	.47	.728	.236	.433	.591	.024	18.5	6.0	11.0	15.0	.6
DMF684*100C	.68	.728	.295	.492	.591	.024	18.5	7.5	12.5	15.0	.6
DMF105*100C	1.0	.728	.335	.531	.591	.031	18.5	8.5	13.5	15.0	.8
DMF155*100D	1.5	.886	.315	.571	.787	.031	22.5	8.0	14.5	20.0	.8
DMF225*100D	2.2	.886	.394	.650	.787	.031	22.5	10.0	16.5	20.0	.8
DMF335*100D	3.3	.886	.472	.787	.787	.031	22.5	12.0	20.0	20.0	.8
DMF475*100D	4.7	.886	.551	.846	.787	.031	22.5	14.0	21.5	20.0	.8
DMF685*100E	6.8	1.260	.571	.925	1.083	.031	32.0	14.5	23.5	27.5	.8
DMF106*100E	10.0	1.260	.709	1.142	1.083	.031	32.0	18.0	29.0	27.5	.8
250 VDC/160 VAC											
DMF103*250A	.01	.413	0.217	.354	.295	.024	10.5	5.5	9.0	7.5	.6
DMF153*250A	.015	.413	0.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF223*250A	.022	.413	0.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF333*250A	.033	.413	0.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF473*250A	.047	.413	0.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF683*250A	.068	.413	0.256	.394	.295	.024	10.5	6.5	10.0	7.5	.6
DMF104*250B	.1	.512	0.256	.394	.394	.024	13.0	6.5	10.0	10.0	.6
DMF154*250C	.15	.728	0.236	.433	.591	.024	18.5	6.0	11.0	15.0	.6
DMF224*250C	.22	.728	0.256	.453	.591	.024	18.5	6.5	11.5	15.0	.6
DMF334*250C	.33	.728	0.276	.472	.591	.031	18.5	7.0	12.0	15.0	.8
DMF474*250D	.47	.886	0.295	.492	.787	.031	22.5	7.5	12.5	20.0	.8
DMF684*250D	.68	.886	0.335	.531	.787	.031	22.5	8.5	13.5	20.0	.8
DMF105*250D	1.0	.886	0.394	.591	.787	.031	22.5	10.0	15.0	20.0	.8
DMF155*250E	1.5	1.260	0.374	.689	1.083	.031	32.0	9.5	17.5	27.5	.8
DMF225*250E	2.2	1.260	0.413	.748	1.083	.031	32.0	10.5	19.0	27.5	.8
DMF335*250E	3.3	1.260	0.531	.906	1.083	.031	32.0	13.5	23.0	27.5	.8
DMF475*250F	4.7	1.417	0.551	.945	1.280	.031	36.0	14.0	24.0	32.5	.8
DMF685*250G	6.8	1.654	0.630	1.063	1.476	.039	42.0	16.0	27.0	37.5	1.0
DMF106*250G	10.0	1.654	0.748	1.378	1.476	.039	42.0	19.0	35.0	37.5	1.0

* Indicate capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

Note: Add "TA" to end of part number for Tape and Ammo

DMF Series
Metallized Polyester / Radial Leads

NEW

MALLORY

Catalog Number	Cap µF	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
400 VDC/200 VAC											
DMF103*400A	.01	.413	.217	.354	.295	.024	10.5	5.5	9.0	7.5	.6
DMF153*400A	.015	.413	.236	.374	.295	.024	10.5	6.0	9.5	7.5	.6
DMF223*400B	.022	.512	.236	.374	.394	.024	13.0	6.0	9.5	10.0	.6
DMF333*400B	.033	.512	.256	.394	.394	.024	13.0	6.5	10.0	10.0	.6
DMF473*400B	.047	.512	.276	.472	.394	.024	13.0	7.0	12.0	10.0	.6
DMF683*400B	.068	.512	.315	.512	.394	.024	13.0	8.0	13.0	10.0	.6
DMF104*400C	.1	.728	.276	.492	.591	.031	18.5	7.0	12.5	15.0	.8
DMF154*400C	.15	.728	.315	.531	.591	.031	18.5	8.0	13.5	15.0	.8
DMF224*400D	.22	.886	.315	.571	.787	.031	22.5	8.0	14.5	20.0	.8
DMF334*400D	.33	.886	.354	.591	.787	.031	22.5	9.0	15.0	20.0	.8
DMF474*400D	.47	.886	.453	.728	.787	.031	22.5	11.5	18.5	20.0	.8
DMF684*400E	.68	1.260	.472	.748	1.083	.031	32.0	12.0	19.0	27.5	.8
DMF105*400E	1.0	1.260	.531	.846	1.083	.031	32.0	13.5	21.5	27.5	.8
DMF155*400F	1.5	1.417	.551	.925	1.280	.031	36.0	14.0	23.5	32.5	.8
DMF225*400F	2.2	1.417	.728	1.083	1.280	.031	36.0	18.5	27.5	32.5	.8
DMF335*400G	3.3	1.654	.728	1.201	1.476	.039	42.0	18.5	30.5	37.5	1.0
DMF475*400H	4.7	1.811	.866	1.339	1.673	.039	46.0	22.0	34.0	42.5	1.0
630 VDC/220 VAC											
DMF103*630B	.01	.512	.236	.394	.394	.024	13.0	6.0	10.0	10.0	.6
DMF153*630B	.015	.512	.256	.413	.394	.024	13.0	6.5	10.5	10.0	.6
DMF223*630B	.022	.512	.295	.492	.394	.024	13.0	7.5	12.5	10.0	.6
DMF333*630C	.033	.728	.256	.472	.591	.024	18.5	6.5	12.0	15.0	.6
DMF473*630C	.047	.728	.295	.492	.591	.024	18.5	7.5	12.5	15.0	.6
DMF683*630C	.068	.728	.335	.551	.591	.031	18.5	8.5	14.0	15.0	.8
DMF104*630C	.1	.728	.394	.571	.591	.031	18.5	10.0	14.5	15.0	.8
DMF154*630D	.15	.886	.374	.650	.787	.031	22.5	9.5	16.5	20.0	.8
DMF224*630D	.22	.886	.453	.748	.787	.031	22.5	11.5	19.0	20.0	.8
DMF334*630E	.33	1.260	.472	.748	1.083	.031	32.0	12.0	19.0	27.5	.8
DMF474*630E	.47	1.260	.531	.866	1.083	.031	32.0	13.5	22.0	27.5	.8
DMF684*630F	.68	1.417	.571	.886	1.280	.031	36.0	14.5	22.5	32.5	.8
DMF105*630F	1.0	1.417	.630	1.142	1.280	.031	36.0	16.0	29.0	32.5	.8
DMF155*630G	1.5	1.654	.728	1.161	1.476	.039	42.0	18.5	29.5	37.5	1.0
DMF225*630H	2.2	1.811	.807	1.280	1.673	.039	46.0	20.5	32.5	42.5	1.0

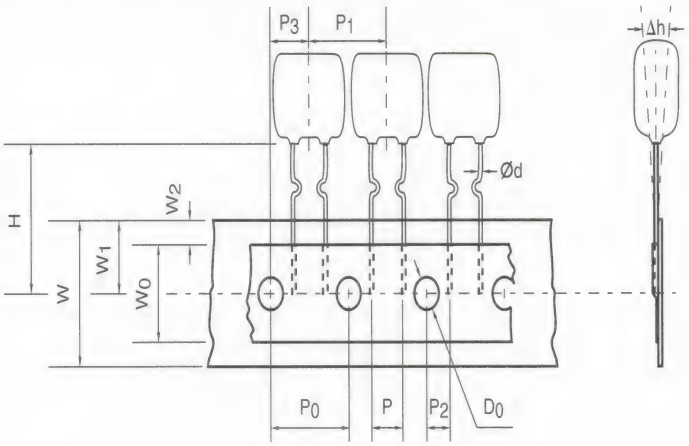
* Indicate capacitance tolerance: J = ±5%, K = ±10%, M = ±20%

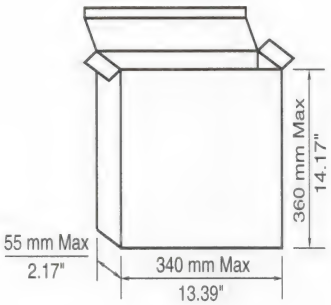
Note: Add "TA" to end of part number for Tape and Ammo

NEW

DMF Series
Metallized Polyester / Radial Leads

MALLORY





Ammo Box Packing

Dimensions

Item	Code	Millimeters	Inches
Lead-Wire Diameter	Ød	$0.6^{\pm.05}$	$.024^{\pm.002}$
Lead-to-Lead Distance	P	SEE CHART	
Feed Hole Pitch	p_0	$12.7^{\pm0.3}$	$.5^{\pm.012}$
Pitch of Component	p_1	SEE CHART	
Hole Center to Lead	p_2	$3.85^{\pm0.7}$	$.152^{\pm.028}$
Feed Hole Center to Component Center	p_3	$6.35^{\pm1.3}$	$.250^{\pm.051}$
Component Alignment, F-R	Δh	$0^{\pm2.0}$	$0^{\pm.079}$
Tape Width	W	$18^{+1.0-0.5}$	$.709^{+.039-.020}$
Hold-Down Tape Width	W_0	12.5 min	.492 min
Hole Position	W_1	$9.0^{+0.5}$	$.354^{\pm.020}$
Hold-Down Tape Position	W_2	3.0 Max	.118 Max
Height of Component from Tape Center	H	$16.0^{\pm0.5}$	$.630^{\pm.02}$
Feed Hole Diameter	D_0	$4.0^{\pm0.2}$	$.157^{\pm.008}$

Component Quantity Per Ammo Pack

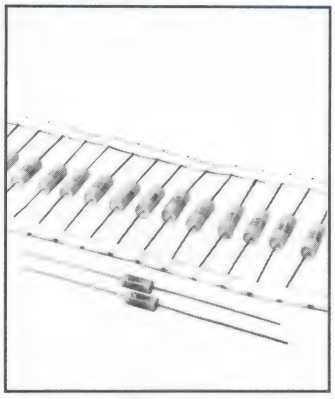
Case Code	Quantity Ammo Pack
A	1000
B	800
C	300
D	200

Size Code	P Dimension		p_1 Dimension	
	Millimeters ±0.8-0.2	Inches ±.031-.008	Millimeters ±1.0	Inches ±.040
A	5.0	.197	12.7	.500
B	5.0	.197	15.0	.591
C	7.5	.295	25.4	1.0
D	7.5	.295	25.4	1.0

*Taping not available for lead spacing greater than 20.0mm or .780in.

150 Series
Metallized Polyester / Axial Leads

MALLORY



- Low Leakage
- Non-Polar
- Axial Leads
  Lead Material - Tinned Copper Wire (Min. Lead content 5%)
- Available Tape and Reel
- Tape Wrapped with Epoxy End Fill
- Non Inductively Wound
- Flame Retardant Polyester Wrap Meets UL510
- Epoxy End Fill Meets UL94V-0

GENERAL SPECIFICATIONS

Operating Temperature:
-55° C to +125° C with voltage derating above 85° C

Voltage Range:
63 VDC to 1000 VDC

Capacitance Range:
0.001 μF to 10 μF

Capacitance Tolerance:
±5%, ±10%, ±20%

Total Self Inductance (L):
1nH maximum per 1mm lead and capacitor length

Dielectric Withstand Voltage:
1.6 x Rated Voltage for 2 sec at +25° C ± 5° C

CECC Approval:
Detail Specification 30401-021

Excellent choice for general purpose applications such as blocking, bypass, decoupling, smoothing and some timing, energy storage/discharge and arc suppression.

Dissipation Factor (DF)
tgδ x 10^{-4} at +25° C ± 5° C

	KHz	C≤0.1μF	0.1μF<C≤1μF	C>1μF
Max Value	1	80	80	100
Typical Value	10	150	150	—
	100	250	—	—

Maximum Pulse Rise Time dv/dt and Pulse Characteristic (Wo)

Vn	L max ≤ 16.5	19-20.5	26.5-28	31.5-33	
50-63	4	2	1.5	1	dv/dt (V/μsec)
	504	252	189	126	Wo (V^2/μsec)
100	5	3	2	1	dv/dt (V/μsec)
	1,000	600	400	300	Wo (V^2/μsec)
250	10	7	4	2.5	dv/dt (V/μsec)
	5,000	3,500	2,000	1,250	Wo (V^2/μsec)
400	13.5	10	6.5	4	dv/dt (V/μsec)
	10,800	8,000	5,200	3,200	Wo (V^2/μsec)
630	20	15	10	6	dv/dt (V/μsec)
	25,200	18,900	12,600	7,560	Wo (V^2/μsec)

If the working voltage (V) is less than the nominal voltage (Vn), the capacitor can work at higher dv/dt. In this case, the maximum value allowed is obtained by multiplying the above value (See table dv/dt) with the ratio Vn/V.
The pulse characteristic (Wo) is a function of the peak-to-peak voltage and may not exceed the value given in the above table.

Tape and Reel Specifications^

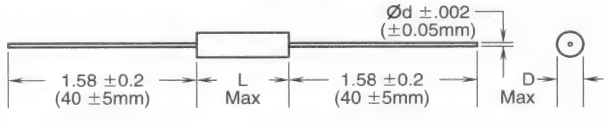
L Max (Body Length)		Lead Spacing		Distance Between Reel Flanges		Class
Inches	mm	Inches	mm	Inches	mm	
≤.433	≤11	2.06	52.4	3.0	75	1
.551 - .808	14 - 20.5	2.5	63.6	3.4	86	2
≥1.03	≥26	2.87	73	3.7	95	3

^ Add class number (1, 2, or 3) to Catalog Number to indicate tape and reel

Diameter		Quantity per Reel
Inches	mm	
.197	5	3,000
.236 thru .256	6.0 thru 6.5	1,200
.276	7	1,100
.315 thru .346	8 thru 8.5	800
.354 thru .413	9 thru 10.5	500
.433 thru .512	11 thru 13	300
.551 thru .571	14 thru 14.5	200
>.571	>14.5	Not available

Test Method and Performance

Insulation Resistance	
Test Conditions	
Temperature	25°C ±5°C
Voltage Charge Time	1 minute
Voltage Charge	50 VDC for Vn < 100 VDC 100 VDC for Vn ≥ 100 VDC
Performance	
For Vn > 100 VDC	≥30,000 MΩ for C ≤ 0.33μF ≥10,000 MΩ x μF for C > 0.33μF
For Vn ≤ 100 VDC	≥10,000 MΩ for C ≤ 0.1μF ≥ 1,000 MΩ x μF for C > 0.1μF
Damp Heat Test	
Test Conditions	
Temperature	+40°C
Relative Humidity	95%
Test Duration	21 days
Performance	
Capacitance Change ΔC/C	≤ ± 5%
DF Change Δtgδ	≤ 50 x 10^{-4} at 1kHz
Insulation Resistance	≥50% of limit value
Life Test	
Test Conditions	
Temperature	+85°C
Test Duration	1000 hrs
Voltage Applied	1.25 x Vn
Performance	
Capacitance ChangeΔC/C	≤ ± 5%
DF Change Δtgδ	≤ 30 x 10^{-4} at 10kHz for C ≤ 1μF ≤ 20 x 10^{-4} at 1kHz for C > 1μF
Insulation Resistance	≥ 50% of limit value
Soldering	
Test Conditions	
Soldering Temperature	260°C ± 5°C
Soldering Duration	10 sec ± 1 sec
Performance	
Capacitance Change ΔC/C	≤ ± 2%
DF Change Δtgδ	≤ 30 x 10^{-4} at 10kHz for C ≤ 1μF ≤ 20 x 10^{-4} at 1kHz for C > 1μF
Insulation Resistance	≥ 50% of limit value
Long Term Stability (after two years)	
Storage	Standard Environmental Conditions
Performance	
Capacitance Change ΔC/C	≤ ± 3%



150 Series
Metallized Polyester / Axial Leads

MALLORY

Catalog Number	Cap µF	Inches D Max	Inches L Max	Inches Ød	Millimeters D Max	Millimeters L Max	Millimeters Ød
63 VDC/40 VAC							
150154*63AA^	.15	.197	.433	.024	5.0	11.0	.6
150184*63AA^	.18	.197	.433	.024	5.0	11.0	.6
150224*63BB^	.22	.236	.650	.024	6.0	16.5	.6
150274*63BB^	.27	.236	.650	.024	6.0	16.5	.6
150334*63BB^	.33	.236	.650	.024	6.0	16.5	.6
150394*63CB^	.39	.256	.650	.024	6.5	16.5	.6
150474*63DB^	.47	.276	.650	.024	7.0	16.5	.6
150564*63DB^	.56	.276	.650	.024	7.0	16.5	.6
150684*63DC^	.68	.276	.807	.024	7.0	20.5	.6
150824*63EC^	.82	.315	.807	.031	8.0	20.5	.8
150105*63EC^	1.0	.315	.807	.031	8.0	20.5	.8
150155*63HC^	1.5	.374	.807	.031	9.5	20.5	.8
150225*63HE^	2.2	.374	1.102	.031	9.5	28.0	.8
150335*63KE^	3.3	.433	1.102	.031	11.0	28.0	.8
150475*63ME^	4.7	.492	1.102	.031	12.5	28.0	.8
150685*63QF^	6.8	.571	1.299	.031	14.5	33.0	.8
150106*63TF^	10.0	.610	1.299	.031	15.5	33.0	.8
100 VDC/63 VAC							
150683*100AA^	.068	.197	.433	.024	5.0	11.0	.6
150823*100AA^	.082	.197	.433	.024	5.0	11.0	.6
150104*100AA^	.1	.197	.433	.024	5.0	11.0	.6
150124*100BB^	.12	.236	.650	.024	6.0	16.5	.6
150154*100BB^	.15	.236	.650	.024	6.0	16.5	.6
150184*100CB^	.18	.256	.650	.024	6.5	16.5	.6
150224*100CB^	.22	.256	.650	.024	6.5	16.5	.6
150274*100CB^	.27	.256	.650	.024	6.5	16.5	.6
150334*100EB^	.33	.315	.650	.031	8.0	16.5	.8
150394*100EB^	.39	.315	.650	.031	8.0	16.5	.8
150474*100DC^	.47	.276	.807	.031	7.0	20.5	.8
150564*100EC^	.56	.315	.807	.031	8.0	20.5	.8
150684*100FC^	.68	.335	.807	.031	8.5	20.5	.8
150824*100HC^	.82	.374	.807	.031	9.5	20.5	.8
150105*100IC^	1.0	.394	.807	.031	10.0	20.5	.8
150155*100IE^	1.5	.394	1.102	.031	10.0	28.0	.8
150225*100LE^	2.2	.453	1.102	.031	11.5	28.0	.8
150335*100PE^	3.3	.531	1.102	.031	13.5	28.0	.8
150475*100RF^	4.7	.591	1.299	.031	15.0	33.0	.8
150685*100WF^	6.8	.689	1.299	.031	17.5	33.0	.8
150106*100YF^	10.0	.807	1.299	.031	20.5	33.0	.8
250 VDC/160 VAC							
150123*250AA^	.012	.197	.433	.024	5.0	11.0	.6
150153*250AA^	.015	.197	.433	.024	5.0	11.0	.6
150183*250AA^	.018	.197	.433	.024	5.0	11.0	.6
150223*250AA^	.022	.197	.433	.024	5.0	11.0	.6
150273*250AA^	.027	.197	.433	.024	5.0	11.0	.6
150333*250AA^	.033	.197	.433	.024	5.0	11.0	.6
150393*250AA^	.039	.197	.433	.024	5.0	11.0	.6
150473*250AA^	.047	.197	.433	.024	5.0	11.0	.6
150563*250AA^	.056	.197	.433	.024	5.0	11.0	.6
150683*250BB^	.068	.236	.650	.024	6.0	16.5	.6
150823*250BB^	.082	.236	.650	.024	6.0	16.5	.6
150104*250CB^	.10	.256	.650	.024	6.5	16.5	.6
150124*250DB^	.12	.276	.650	.024	7.0	16.5	.6
150154*250EB^	.15	.315	.650	.031	8.0	16.5	.8
150184*250EB^	.18	.315	.650	.031	8.0	16.5	.8
150224*250FB^	.22	.335	.650	.031	8.5	16.5	.8
150274*250EC^	.27	.315	.807	.031	8.0	20.5	.8
150334*250FC^	.33	.335	.807	.031	8.5	20.5	.8
150394*250GC^	.39	.354	.807	.031	9.0	20.5	.8
150474*250HC^	.47	.374	.807	.031	9.5	20.5	.8
150564*250IC^	.56	.394	.807	.031	10.0	20.5	.8
150684*250GE^	.68	.354	1.102	.031	9.0	28.0	.8
150824*250HE^	.82	.374	1.102	.031	9.5	28.0	.8
150105*250JE^	1.0	.413	1.102	.031	10.5	28.0	.8
150155*250ME^	1.5	.492	1.102	.031	12.5	28.0	.8
150225*250PF^	2.2	.531	1.299	.031	13.5	33.0	.8
150335*250TF^	3.3	.610	1.299	.031	15.5	33.0	.8
150475*250XF^	4.7	.728	1.299	.031	18.5	33.0	.8
150685*250ZF^	6.8	.845	1.299	.031	21.5	33.0	.8

Catalog Number	Cap µF	Inches D Max	Inches L Max	Inches Ød	Millimeters D Max	Millimeters L Max	Millimeters Ød
400 VDC/200 VAC							
150822*400AA^	.0082	.197	.433	.024	5.0	11.0	.6
150103*400AA^	.01	.197	.433	.024	5.0	11.0	.6
150123*400AA^	.012	.197	.433	.024	5.0	11.0	.6
150153*400BB^	.015	.236	.650	.024	6.0	16.5	.6
150183*400BB^	.018	.236	.650	.024	6.0	16.5	.6
150223*400BB^	.022	.236	.650	.024	6.0	16.5	.6
150273*400BB^	.027	.236	.650	.024	6.0	16.5	.6
150333*400BB^	.033	.236	.650	.024	6.0	16.5	.6
150393*400CB^	.039	.256	.650	.024	6.5	16.5	.6
150473*400DB^	.047	.276	.650	.024	7.0	16.5	.6
150563*400EB^	.056	.315	.650	.024	8.0	16.5	.6
150683*400DC^	.068	.276	.807	.024	7.0	20.5	.6
150823*400EC^	.082	.315	.807	.031	8.0	20.5	.8
150104*400EC^	.10	.315	.807	.031	8.0	20.5	.8
150124*400EC^	.12	.315	.807	.031	8.0	20.5	.8
150154*400GC^	.15	.354	.807	.031	9.0	20.5	.8
150184*400EE^	.18	.315	1.102	.031	8.0	28.0	.8
150224*400FE^	.22	.335	1.102	.031	8.5	28.0	.8
150274*400GE^	.27	.354	1.102	.031	9.0	28.0	.8
150334*400IE^	.33	.394	1.102	.031	10.0	28.0	.8
150394*400JE^	.39	.413	1.102	.031	10.5	28.0	.8
150474*400LF^	.47	.453	1.299	.031	11.5	33.0	.8
150564*400LF^	.56	.453	1.299	.031	11.5	33.0	.8
150684*400MF^	.68	.492	1.299	.031	12.5	33.0	.8
150824*400PF^	.82	.531	1.299	.031	13.5	33.0	.8
150105*400QF^	1.0	.571	1.299	.031	14.5	33.0	.8
150155*400WF^	1.5	.689	1.299	.031	17.5	33.0	.8
150225*400YF^	2.2	.807	1.299	.031	20.5	33.0	.8
630 VDC/220 VAC							
150102*630AA^	.001	.197	.433	.024	5.0	11.0	.6
150122*630AA^	.0012	.197	.433	.024	5.0	11.0	.6
150152*630AA^	.0015	.197	.433	.024	5.0	11.0	.6
150182*630AA^	.0018	.197	.433	.024	5.0	11.0	.6
150222*630AA^	.0022	.197	.433	.024	5.0	11.0	.6
150272*630AA^	.0027	.197	.433	.024	5.0	11.0	.6
150332*630AA^	.0033	.197	.433	.024	5.0	11.0	.6
150392*630AA^	.0039	.197	.433	.024	5.0	11.0	.6
150472*630AA^	.0047	.197	.433	.024	5.0	11.0	.6
150562*630AA^	.0056	.197	.433	.024	5.0	11.0	.6
150682*630AA^	.0068	.197	.433	.024	5.0	11.0	.6
150822*630BB^	.0082	.236	.650	.024	6.0	16.5	.6
150103*630BB^	.01	.236	.650	.024	6.0	16.5	.6
150123*630BB^	.012	.236	.650	.024	6.0	16.5	.6
150153*630BB^	.015	.236	.650	.024	6.0	16.5	.6
150183*630CB^	.018	.256	.650	.024	6.5	16.5	.6
150223*630DB^	.022	.276	.650	.024	7.0	16.5	.6
150273*630CC^	.027	.256	.807	.024	6.5	20.5	.6
150333*630EC^	.033	.315	.807	.031	8.0	20.5	.8
150393*630EC^	.039	.315	.807	.031	8.0	20.5	.8
150473*630EC^	.047	.315	.807	.031	8.0	20.5	.8
150563*630FC^	.056	.335	.807	.031	8.5	20.5	.8
150683*630GC^	.068	.354	.807	.031	9.0	20.5	.8
150823*630HC^	.082	.374	.807	.031	9.5	20.5	.8
150104*630FE^	.10	.335	1.102	.031	8.5	28.0	.8
150124*630GE^	.12	.354	1.102	.031	9.0	28.0	.8
150154*630IE^	.15	.394	1.102	.031	10.0	28.0	.8
150184*630JE^	.18	.413	1.102	.031	10.5	28.0	.8
150224*630LE^	.22	.453	1.102	.031	11.5	28.0	.8
150274*630ME^	.27	.492	1.102	.031	12.5	28.0	.8
150334*630NF^	.33	.512	1.299	.031	13.0	33.0	.8
150394*630QF^	.39	.571	1.299	.031	14.5	33.0	.8
150474*630RF^	.47	.591	1.299	.031	15.0	33.0	.8
150564*630TF^	.56	.610	1.299	.031	15.5	33.0	.8
150684*630WF^	.68	.689	1.299	.031	17.5	33.0	.8
150824*630XF^	.82	.728	1.299	.031	18.5	33.0	.8
150105*630YF^	1.0	.807	1.299	.031	20.5	33.0	.8

* Indicate capacitance tolerance
J = ±5%
K = ±10%
M = ±20%

^ If ordering Tape & Reel, insert 1, 2, or 3
(See page 193 to determine which class applies)

150 Series
Metallized Polyester / Axial Leads

MALLORY

Catalog Number	Cap µF	Inches			Millimeters		
		D Max	L Max	Ød	D Max	L Max	Ød
1000 VDC/250 VAC							
150102*1000CB^	.001	.256	.650	.031	6.5	16.5	.8
150152*1000CB^	.0015	.256	.650	.031	6.5	16.5	.8
150222*1000CB^	.0022	.256	.650	.031	6.5	16.5	.8
150332*1000CB^	.0033	.256	.650	.031	6.5	16.5	.8
150472*1000DB^	.0047	.276	.650	.031	7.0	16.5	.8
150682*1000EB^	.0068	.315	.650	.031	8.0	16.5	.8
150103*1000DC^	.01	.276	.807	.031	7.0	20.5	.8
150153*1000FC^	.015	.335	.807	.031	8.5	20.5	.8
150223*1000HC^	.022	.374	.807	.031	9.5	20.5	.8

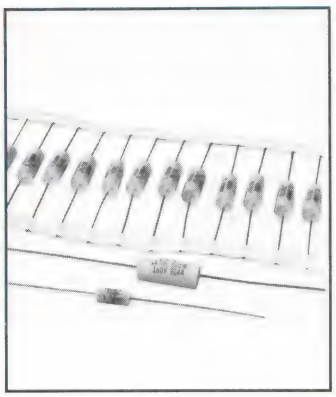
Catalog Number	Cap µF	Inches			Millimeters		
		D Max	L Max	Ød	D Max	L Max	Ød
1000 VDC/250 VAC							
150333*1000FE^	.033	.335	1.102	.031	8.5	28.0	.8
150473*1000HE^	.047	.374	1.102	.031	9.5	28.0	.8
150683*1000KE^	.068	.433	1.102	.031	11.0	28.0	.8
150104*1000NE^	.1	.512	1.102	.031	13.0	28.0	.8
150154*1000OF^	.15	.551	1.299	.031	14.0	33.0	.8
150224*1000WF^	.22	.689	1.299	.031	17.5	33.0	.8
150334*1000YF^	.33	.807	1.299	.031	20.5	33.0	.8
150474*1000Z1F^	.47	.945	1.299	.031	24.0	33.0	.8

* Indicate capacitance tolerance
J = ±5%
K = ±10%
M = ±20%

^ If ordering Tape & Reel, insert 1, 2, or 3
(See page 193 to determine which class applies)

170 Series
Metallized Polypropylene / Axial Leads

MALLORY



- Axial Leads
- Available Tape and Reel For Automatic Insertion
- Non Inductively Wound
- Non-Polar
- Flame Retardant Polyester Wrap Meets UL510
- Epoxy Encapsulant Meets UL94V-0
- Lead Material Tinned Copper Wire Minimum Lead Content 5%

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +105°C with voltage derating above 85°C

Voltage Range:
160 VDC (90 VAC) to 630 VDC (250 VAC)

Capacitance Range:
0.001 μF to 4.7 μF

Capacitance Tolerance:
±5%, ±10%, ±20%

Total Self Inductance (L):
1nH maximum per 1mm lead and capacitor length

Dielectric Eithstand Voltage:
1.6 Rated Voltage for 2 sec at +25°C ±5°C

Dissipation Factor (DF)
tgδ x 10^{-4} at +25°C ± 5°C

kHz	C <0.1μF	C 0.1μF to 1μF	C >1μF
1	≤6	≤6	≤6
10	≤10	≤20	
100	≤30		

Excellent choice for applications requiring low dielectric losses, high voltage capability and stable characteristics.

Maximum Pulse Rise Time dv/dt (V/μsec)

Vn	L max 11	16.5	20.5	28	33
160	5	5	3	2	1
250	11	10	7	4	2.5
400	—	13.5	10	6.5	4
630	—	20	15	10	6

If the working voltage (V) is less than the nominal voltage (Vn), the capacitor can work at higher dv/dt. In this case, the maximum value allowed is obtained by multiplying the above value (See table dv/dt) with the ratio Vn/V.

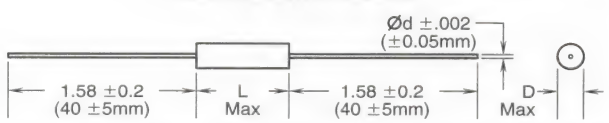
Tape and Reel Specifications^

L Max (Body Length)		Lead Spacing		Distance Between Reel Flanges		Class
Inches	mm	Inches	mm	Inches	mm	
≤.433	≤11	2.06	52.4	3.0	75	1
.551 - .808	14 - 20.5	2.5	63.6	3.4	86	2
≥1.03	≥26	2.87	73	3.7	95	3

^ Add class number (1, 2, or 3) to Catalog Number to indicate tape and reel

Diameter Inches	Diameter mm	Quantity per Reel
.197	5	3,000
.236 thru .256	6.0 thru 6.5	1,200
.276	7	1,100
.315 thru .346	8 thru 8.5	800
.354 thru .413	9 thru 10.5	500
.433 thru .512	11 thru 13	300
.551 thru .571	14 thru 14.5	200
>.571	>14.5	Not available

Outline Dimensions



Test Method and Performance

Insulation Resistance	
Test Conditions	
Temperature	25°C ±5°C
Voltage Charge Time	1 minute
Voltage Charge	100 VDC
Performance	
For C ≤ 0.33μF	≥1 x 10^5 MΩ
For C > 0.33μF	≥30,000 MΩ x μF
Damp Heat Test	
Test Conditions	
Temperature	+40°C
Relative Humidity	95%
Test Duration	21 days
Performance	
Capacitance Change ΔC/C	≤ ± 2%
DF Change Δtgδ	≤ 10 x 10^{-4} at 1kHz
Insulation Resistance	≥ 50% of limit value
Life Test	
Test Conditions	
Temperature	+85°C
Test Duration	1000 hrs
Voltage Applied	1.25 x Vn
Performance	
Capacitance Change ΔC/C	≤ ± 3%
DF Change Δtgδ	≤ 10 x 10^{-4} for C > 1μF at 1kHz ≤ 10 x 10^{-4} for C ≤ 1μF at 10kHz
Insulation Resistance	≥ 50% of limit value
Soldering	
Test Conditions	
Soldering Temperature	+260°C ± 5°C
Soldering Duration	10 sec ± 1 sec
Performance	
Capacitance Change ΔC/C	≤ ± 1%
DF Change Δtgδ	≤ 10 x 10^{-4} for C > 1μF at 1kHz ≤ 10 x 10^{-4} for C ≤ 1μF at 10kHz
Insulation Resistance	≥ 50% of limit value
Long Term Stability (after two years)	
Storage	Standard Environmental Conditions
Performance	
Capacitance Change ΔC/C	≤ ± 0.5%

170 Series
Metallized Polypropylene / Axial Leads

MALLORY

Catalog Number	Cap µF	Inches			Millimeters			ESR (mOhms) 20kHz to 100kHz	IRMS (Amps)		
		D Max	L Max	Ød	D Max	L Max	Ød		25°C	45°C	85°C
160 VDC/90 VAC											
170223*160AA^	.022	.197	.433	.020	5.0	11.0	.5	Not applicable. These capacitance values are not customarily used in switched-mode power supplies.			
170273*160AA^	.027	.197	.433	.020	5.0	11.0	.5				
170333*160AA^	.033	.197	.433	.020	5.0	11.0	.5				
170393*160AA^	.039	.197	.433	.020	5.0	11.0	.5				
170473*160AA^	.047	.197	.433	.020	5.0	11.0	.5				
170563*160BB^	.056	.236	.650	.024	6.0	16.5	.6				
170683*160BB^	.068	.236	.650	.024	6.0	16.5	.6				
170823*160BB^	.082	.236	.650	.024	6.0	16.5	.6				
170104*160BB^	.10	.236	.650	.024	6.0	16.5	.6				
170124*160DB^	.12	.276	.650	.024	7.0	16.5	.6				
170154*160DB^	.15	.276	.650	.024	7.0	16.5	.6				
170184*160EB^	.18	.315	.650	.031	8.0	16.5	.8				
170224*160EB^	.22	.315	.650	.031	8.0	16.5	.8				
170274*160EC^	.27	.315	.807	.031	8.0	20.5	.8				
170334*160EC^	.33	.315	.807	.031	8.0	20.5	.8				
170394*160HC^	.39	.374	.807	.031	9.5	20.5	.8				
170474*160HC^	.47	.374	.807	.031	9.5	20.5	.8	37.0	8.7	3.1	1.4
170564*160GE^	.56	.354	1.102	.031	9.0	28.0	.8	35.0	3.9	3.3	1.5
170684*160GE^	.68	.354	1.102	.031	9.0	28.0	.8	33.0	4.1	3.5	1.6
170824*160JE^	.82	.413	1.102	.031	10.5	28.0	.8	31.0	4.3	3.6	1.7
170105*160JE^	1.0	.413	1.102	.031	10.5	28.0	.8	26.0	5.5	4.7	2.6
170155*160ME^	1.5	.472	1.102	.031	12.0	28.0	.8	20.0	6.1	5.1	3.1
170225*160PF^	2.2	.531	1.299	.031	13.5	33.0	.8	18.0	6.8	5.7	3.3
170335*160TF^	3.3	.610	1.299	.039	15.5	33.0	1.0	16.0	7.4	6.4	3.6
170475*160XF^	4.7	.709	1.299	.039	18.0	33.0	1.0	15.0	8.1	6.8	3.9
250 VDC/200 VAC											
170103*250AA^	.010	.197	.433	.020	5.0	11.0	.5	Not applicable. These capacitance values are not customarily used in switched-mode power supplies.			
170123*250AA^	.012	.197	.433	.020	5.0	11.0	.5				
170153*250AA^	.015	.197	.433	.020	5.0	11.0	.5				
170183*250BB^	.018	.236	.650	.024	6.0	16.5	.6				
170223*250BB^	.022	.236	.650	.024	6.0	16.5	.6				
170273*250BB^	.027	.236	.650	.024	6.0	16.5	.6				
170333*250BB^	.033	.236	.650	.024	6.0	16.5	.6				
170393*250CB^	.039	.256	.650	.024	6.5	16.5	.6				
170473*250CB^	.047	.256	.650	.024	6.5	16.5	.6				
170563*250EB^	.056	.315	.650	.031	8.0	16.5	.8				
170683*250EB^	.068	.315	.650	.031	8.0	16.5	.8				
170823*250FB^	.082	.335	.650	.031	8.5	16.5	.8				
170104*250FB^	.10	.335	.650	.031	8.5	16.5	.8				
170124*250FC^	.12	.335	.807	.031	8.5	20.5	.8				
170154*250FC^	.15	.335	.807	.031	8.5	20.5	.8				
170184*250HC^	.18	.374	.807	.031	9.5	20.5	.8				
170224*250HC^	.22	.374	.807	.031	9.5	20.5	.8				
170274*250GE^	.27	.354	1.102	.031	9.0	28.0	.8				
170334*250GE^	.33	.354	1.102	.031	9.0	28.0	.8				
170394*250JE^	.39	.413	1.102	.031	10.5	28.0	.8				
170474*250JE^	.47	.413	1.102	.031	10.5	28.0	.8	35.0	3.8	3.6	1.7
170564*250ME^	.56	.472	1.102	.031	12.0	28.0	.8	33.0	3.9	3.7	1.8
170684*250ME^	.68	.472	1.102	.031	12.0	28.0	.8	32.0	4.0	3.8	1.9
170824*250NF^	.82	.512	1.299	.031	13.0	33.0	.8	31.0	4.2	4.0	2.0
170105*250NF^	1.0	.512	1.299	.031	13.0	33.0	.8	28.0	4.4	4.4	3.2
170155*250TF^	1.5	.610	1.299	.031	15.5	33.0	.8	26.0	5.1	4.9	3.5
170225*250XF^	2.2	.709	1.299	.039	18.0	33.0	1.0	20.0	8.4	7.0	4.1
170335*250ZF^	3.3	.827	1.299	.039	21.0	33.0	1.0	18.0	9.0	7.8	4.5

* Indicate capacitance tolerance
J = ±5%, K = ±10%, M = ±20%

^ If ordering Tape & Reel, insert 1, 2, or 3
(See page 196 to determine which class applies)

170 Series
Metallized Polypropylene / Axial Leads

MALLORY

Catalog Number	Cap µF	Inches			Millimeters			ESR (mOhms) 20kHz to 100kHz	IRMS (Amps)		
		D Max	L Max	Ød	D Max	L Max	Ød		25°C	45°C	85°C
400 VDC/220 VAC											
170153*400BB^	.015	.236	.650	.024	6.0	16.5	.6				
170183*400CB^	.018	.256	.650	.024	6.5	16.5	.6				
170223*400CB^	.022	.256	.650	.024	6.5	16.5	.6				
170273*400DB^	.027	.276	.650	.024	7.0	16.5	.6				
170333*400DB^	.033	.276	.650	.024	7.0	16.5	.6				
170393*400EB^	.039	.315	.650	.031	8.0	16.5	.8				
170473*400EB^	.047	.315	.650	.031	8.0	16.5	.8				
170563*400EC^	.056	.315	.807	.031	8.0	20.5	.8				
170683*400EC^	.068	.315	.807	.031	8.0	20.5	.8				
170823*400GC^	.082	.354	.807	.031	9.0	20.5	.8				
170104*400GC^	.10	.354	.807	.031	9.0	20.5	.8				
170124*400FE^	.12	.335	1.102	.031	8.5	28.0	.8				
170154*400FE^	.15	.335	1.102	.031	8.5	28.0	.8				
170184*400IE^	.18	.394	1.102	.031	10.0	28.0	.8				
170224*400IE^	.22	.394	1.102	.031	10.0	28.0	.8				
170274*400LE^	.27	.453	1.102	.031	11.5	28.0	.8				
170334*400LE^	.33	.453	1.102	.031	11.5	28.0	.8				
170394*400NE^	.39	.512	1.102	.031	13.0	28.0	.8				
170474*400NE^	.47	.512	1.102	.031	13.0	28.0	.8	32.0	5.7	5.0	2.2
170564*400QF^	.56	.571	1.299	.031	14.5	33.0	.8	31.0	5.7	5.3	2.3
170684*400QF^	.68	.571	1.299	.031	14.5	33.0	.8	30.0	5.7	5.5	2.4
170824*400VF^	.82	.669	1.299	.039	17.0	33.0	1.0	28.0	5.7	5.6	2.6
170105*400VF^	1.0	.669	1.299	.039	17.0	33.0	1.0	27.0	5.7	5.7	4.3
170155*400YF^	1.5	.807	1.299	.039	20.5	33.0	1.0	25.0	7.0	6.7	4.7
630 VDC/250 VAC											
170102*630BB^	.0010	.236	.650	.024	6.0	16.5	.6				
170122*630BB^	.0012	.236	.650	.024	6.0	16.5	.6				
170152*630BB^	.0015	.236	.650	.024	6.0	16.5	.6				
170182*630BB^	.0018	.236	.650	.024	6.0	16.5	.6				
170222*630BB^	.0022	.236	.650	.024	6.0	16.5	.6				
170272*630BB^	.0027	.236	.650	.024	6.0	16.5	.6				
170332*630BB^	.0033	.236	.650	.024	6.0	16.5	.6				
170392*630BB^	.0039	.236	.650	.024	6.0	16.5	.6				
170472*630BB^	.0047	.236	.650	.024	6.0	16.5	.6				
170562*630BB^	.0056	.236	.650	.024	6.0	16.5	.6				
170682*630CB^	.0068	.256	.650	.024	6.5	16.5	.6				
170822*630CB^	.0082	.256	.650	.024	6.5	16.5	.6				
170103*630CB^	.010	.256	.650	.024	6.5	16.5	.6				
170123*630EB^	.012	.315	.650	.031	8.0	16.5	.8				
170153*630EB^	.015	.315	.650	.031	8.0	16.5	.8				
170183*630FB^	.018	.335	.650	.031	8.5	16.5	.8				
170223*630FB^	.022	.335	.650	.031	8.5	16.5	.8				
170273*630FC^	.027	.335	.807	.031	8.5	20.5	.8				
170333*630FC^	.033	.335	.807	.031	8.5	20.5	.8				
170393*630HC^	.039	.374	.807	.031	9.5	20.5	.8				
170473*630HC^	.047	.374	.807	.031	9.5	20.5	.8				
170563*630GE^	.056	.354	1.102	.031	9.0	28.0	.8				
170683*630GE^	.068	.354	1.102	.031	9.0	28.0	.8				
170823*630IE^	.082	.394	1.102	.031	10.0	28.0	.8				
170104*630IE^	.10	.394	1.102	.031	10.0	28.0	.8				
170124*630ME^	.12	.472	1.102	.031	12.0	28.0	.8				
170154*630ME^	.15	.472	1.102	.031	12.0	28.0	.8				
170184*630NF^	.18	.512	1.299	.031	13.0	33.0	.8				
170224*630NF^	.22	.512	1.299	.031	13.0	33.0	.8				
170274*630TF^	.27	.610	1.299	.031	15.5	33.0	.8				
170334*630TF^	.33	.610	1.299	.031	15.5	33.0	.8				
170394*630XF^	.39	.709	1.299	.039	18.0	33.0	1.0				
170474*630XF^	.47	.709	1.299	.039	18.0	33.0	1.0	28.0	6.8	5.8	2.6
170564*630ZF^	.56	.827	1.299	.039	21.0	33.0	1.0	26.0	7.4	6.3	2.8
170684*630ZF^	.68	.827	1.299	.039	21.0	33.0	1.0	25.0	7.8	6.8	2.9

Not applicable. These capacitance values are not customarily used in switched-mode power supplies.

Not applicable. These capacitance values are not customarily used in switched-mode power supplies.

* Indicate capacitance tolerance, J = ±5%, K = ±10%, M = ±20%

^ If ordering Tape & Reel, insert 1, 2, or 3
(See page 196 to determine which class applies)

PVC Series - **Polyester Film / Foil (to 1000V)** **Polypropylene Film / Foil (1200 - 2000V)**

MALLORY

- Radial Leaded
- Wire Leads Crimped to Provide Seating on Printed Circuit Boards
- Non Inductively Wound
- Non-Polar
- 100 - 1000 VDC meets UL94V0
  1200 - 2000 VDC meets UL94V2
- Adaptable to all electronic circuit applications calling for bypass and coupling
- Lead Material
  Tinned Copper Clad Steel

GENERAL SPECIFICATIONS

Operating Temperature:
100 - 1000 VDC:
-55°C to +125°C ✻
1200 - 2000 VDC:
-55°C to 105°C✻
(✻Provided the working voltage is reduced to 50% of the 85°C rating.)

Voltage Range:
100 VDC to 2000 VDC

Capacitance Range:
0.001 μF to 1.0 μF

Capacitance Tolerance (1kHz):
±10%

CECC Approval:
Detail Specification 30401-009

Dielectric Withstand Voltage:
Capacitors <1000 volts can withstand a DC potential of 250% of rated voltage between terminals of not more than 5 seconds. However, ≥ 1000 volts the DC potential is 200%

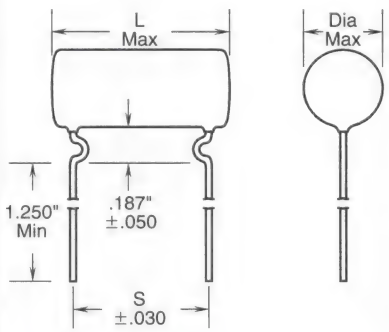
Dissipation Factor (DF):
At +25°C ratings
1200-2000 VDC are 0.1% Max
All others are 0.75% Max

Insulation Resistance (IR)

After a two minute charge at rated voltage or 500 V whichever is less at 25°C

100 - 1000 VDC	
For C ≤ 0.25μF	100,000 MΩ
For C > 0.25μF	25,000 MΩ x μF
1200 - 2000 VDC	
For C ≤ 0.50 μF	400,000 MΩ
For C > 0.50 μF	200,000 MΩ x μF

Outline Dimensions



Test Method and Performance

Lead Pull Test

Capacitor leads shall withstand a steady pull of 5lbs. applied radially to the capacitor body for 1 minute.

Lead Bend Test

Capacitor leads shall be bent without breakage below the lead crimp, first 90° in one direction, then back to the original position and then 90° in the opposite direction.

LifeTest

Conducted at +85°C: 500 hours with 1.5 times rated voltage DC.

Catalog Number	Cap μF	Inches				Millimeters			
		L Max	Dia Max	S Lead Spacing	Ød	L Max	Dia Max	S Lead Spacing	Ød
100VDC/70VAC									
PVC1118	.018	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC1122	.022	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC1127	.027	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC1133	.033	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC114	.040	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC1147	.047	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC1156	.056	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC1168	.068	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC1182	.082	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC101	.10	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC1015	.15	.900	.450	.688	.032	22.9	11.4	17.5	.8
PVC1022	.22	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC1025	.25	1.200	.500	.969	.032	30.5	12.7	24.6	.8
PVC1033	.33	1.200	.500	.969	.032	30.5	12.7	24.6	.8
PVC1039	.39	1.600	.500	1.344	.032	40.6	12.7	34.1	.8
PVC1047	.47	1.600	.500	1.344	.032	40.6	12.7	34.1	.8
PVC105	.50	1.600	.600	1.344	.032	40.6	15.2	34.1	.8
PVC1056	.56	1.600	.600	1.344	.032	40.6	15.2	34.1	.8
PVC1068	.68	1.600	.600	1.344	.032	40.6	15.2	34.1	.8
PVC1082	.82	1.600	.650	1.344	.032	40.6	16.5	34.1	.8
PVC11	1.00	1.600	.700	1.344	.032	40.6	17.8	34.1	.8
200VDC/140VAC									
PVC211	.010	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC2115	.015	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC2118	.018	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC212	.020	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC2122	.022	.700	.330	.500	.032	17.8	8.4	12.7	.8

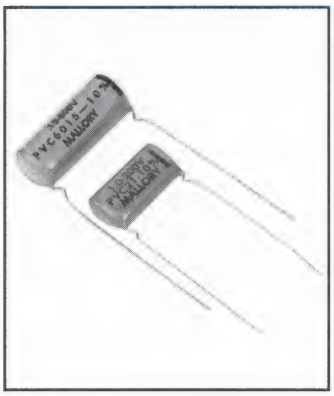
PVC Series - **Polyester Film / Foil (to 1000V)** **Polypropylene Film / Foil (1200 - 2000V)**

MALLORY

Catalog Number	Cap µF	Inches				Millimeters			
		L Max	Dia Max	S Lead Spacing	Ød	L Max	Dia Max	S Lead Spacing	Ød
200VDC/140VAC									
PVC2133	.033	.900	.380	.688	.032	22.9	9.7	17.5	.8
PVC2139	.039	.900	.380	.688	.032	22.9	9.7	17.5	.8
PVC214	.040	.900	.380	.688	.032	22.9	9.7	17.5	.8
PVC2147	.047	.900	.380	.688	.032	22.9	9.7	17.5	.8
PVC215	.050	.900	.380	.688	.032	22.9	9.7	17.5	.8
PVC2156	.056	1.200	.380	.969	.032	30.5	9.7	24.6	.8
PVC2168	.068	1.200	.380	.969	.032	30.5	9.7	24.6	.8
PVC2182	.082	1.200	.400	.969	.032	30.5	10.2	24.6	.8
PVC201	.10	1.200	.400	.969	.032	30.5	10.2	24.6	.8
PVC2015	.15	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC2022	.22	1.200	.500	.969	.032	30.5	12.7	24.6	.8
PVC2025	.25	1.200	.500	.969	.032	30.5	12.7	24.6	.8
PVC2027	.27	1.600	.470	1.344	.032	40.6	11.9	34.1	.8
PVC2033	.33	1.600	.470	1.344	.032	40.6	11.9	34.1	.8
PVC2047	.47	1.600	.560	1.344	.032	40.6	14.2	34.1	.8
PVC205	.50	1.600	.560	1.344	.032	40.6	14.2	34.1	.8
400VDC/200VAC									
PVC421	.0010	.700	.300	.500	.032	17.8	7.6	12.7	.8
PVC4222	.0022	.700	.300	.500	.032	17.8	7.6	12.7	.8
PVC4233	.0033	.700	.300	.500	.032	17.8	7.6	12.7	.8
PVC4247	.0047	.700	.300	.500	.032	17.8	7.6	12.7	.8
PVC4268	.0068	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC411	.010	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC412	.020	.900	.390	.688	.032	22.9	9.9	17.5	.8
PVC4133	.033	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC4147	.047	1.200	.400	.969	.032	30.5	10.2	24.6	.8
PVC415	.050	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC4156	.056	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC4168	.068	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC4182	.082	1.200	.520	.969	.032	30.5	13.2	24.6	.8
PVC401	.10	1.200	.530	.969	.032	30.5	13.5	24.6	.8
PVC4015	.15	1.200	.570	.969	.032	30.5	14.5	24.6	.8
PVC4018	.18	1.600	.600	1.344	.032	40.6	15.2	34.1	.8
PVC4022	.22	1.600	.600	1.344	.032	40.6	15.2	34.1	.8
PVC4025	.25	1.600	.650	1.344	.032	40.6	16.5	34.1	.8
PVC4033	.33	1.600	.650	1.344	.032	40.6	16.5	34.1	.8
PVC4039	.39	1.600	.720	1.344	.032	40.6	18.3	34.1	.8
PVC4047	.47	1.600	.800	1.344	.032	40.6	20.3	34.1	.8
600VDC/200VAC									
PVC621	.0010	.700	.300	.500	.032	17.8	7.6	12.7	.8
PVC6212	.0012	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC6215	.0015	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC6218	.0018	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC622	.0020	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC6222	.0022	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC6225	.0025	.700	.340	.500	.032	17.8	8.6	12.7	.8
PVC6227	.0027	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC623	.0030	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC6233	.0033	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC6239	.0039	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC624	.0040	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC6247	.0047	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC625	.0050	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC6256	.0056	.700	.400	.500	.032	17.8	10.2	12.7	.8
PVC626	.006	.700	.400	.500	.032	17.8	10.2	12.7	.8
PVC6268	.0068	.700	.400	.500	.032	17.8	10.2	12.7	.8
PVC6275	.0075	.700	.400	.500	.032	17.8	10.2	12.7	.8
PVC628	.0080	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC6282	.0082	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC611	.010	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC6112	.012	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC6115	.015	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC6118	.018	.900	.450	.688	.032	22.9	11.4	17.5	.8
PVC612	.020	.900	.450	.688	.032	22.9	11.4	17.5	.8
PVC6122	.022	.900	.450	.688	.032	22.9	11.4	17.5	.8
PVC6125	.025	.900	.450	.688	.032	22.9	11.4	17.5	.8

PVC Series - **Polyester Film / Foil (to 1000V)** **Polypropylene Film / Foil (1200 - 2000V)**

MALLORY



- Radial Leaded
- Wire Leads Crimped to Provide Seating on Printed Circuit Boards
- Non Inductively Wound
- Non-Polar
- 100 - 1000 VDC meets UL94V0
  1200 - 2000 VDC meets UL94V2
- Adaptable to all electronic circuit applications calling for bypass and coupling
- Lead Material
  Tinned Copper Clad Steel

GENERAL SPECIFICATIONS

Operating Temperature:
100 - 1000 VDC:
-55°C to +125°C ✻
1200 - 2000 VDC:
-55°C to 105°C✻
(✻Provided the working voltage is reduced to 50% of the 85°C rating.)

Voltage Range:
100 VDC to 2000 VDC

Capacitance Range:
0.001 μF to 1.0 μF

Capacitance Tolerance (1kHz):
±10%

CECC Approval:
Detail Specification 30401-009

Dielectric Withstand Voltage:
Capacitors <1000 volts can withstand a DC potential of 250% of rated voltage between terminals of not more than 5 seconds. However, ≥ 1000 volts the DC potential is 200%

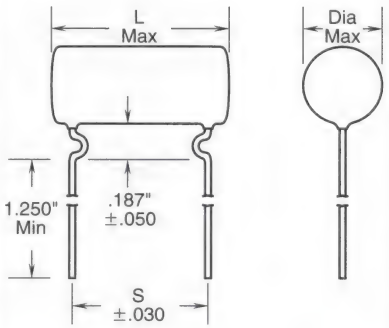
Dissipation Factor (DF):
At +25°C ratings
1200-2000 VDC are 0.1% Max
All others are 0.75% Max

Insulation Resistance (IR)

After a two minute charge at rated voltage or 500 V whichever is less at 25°C

100 - 1000 VDC	
For C ≤ 0.25μF	100,000 MΩ
For C > 0.25μF	25,000 MΩ x μF
1200 - 2000 VDC	
For C ≤ 0.50 μF	400,000 MΩ
For C > 0.50 μF	200,000 MΩ x μF

Outline Dimensions



Test Method and Performance

Lead Pull Test

Capacitor leads shall withstand a steady pull of 5lbs. applied radially to the capacitor body for 1 minute.

Lead Bend Test

Capacitor leads shall be bent without breakage below the lead crimp, first 90° in one direction, then back to the original position and then 90° in the opposite direction.

LifeTest

Conducted at +85°C: 500 hours with 1.5 times rated voltage DC.

Catalog Number	Cap μF	Inches				Millimeters			
		L Max	Dia Max	S Lead Spacing	Ød	L Max	Dia Max	S Lead Spacing	Ød
100VDC/70VAC									
PVC1118	.018	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC1122	.022	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC1127	.027	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC1133	.033	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC114	.040	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC1147	.047	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC1156	.056	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC1168	.068	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC1182	.082	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC101	.10	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC1015	.15	.900	.450	.688	.032	22.9	11.4	17.5	.8
PVC1022	.22	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC1025	.25	1.200	.500	.969	.032	30.5	12.7	24.6	.8
PVC1033	.33	1.200	.500	.969	.032	30.5	12.7	24.6	.8
PVC1039	.39	1.600	.500	1.344	.032	40.6	12.7	34.1	.8
PVC1047	.47	1.600	.500	1.344	.032	40.6	12.7	34.1	.8
PVC105	.50	1.600	.600	1.344	.032	40.6	15.2	34.1	.8
PVC1056	.56	1.600	.600	1.344	.032	40.6	15.2	34.1	.8
PVC1068	.68	1.600	.600	1.344	.032	40.6	15.2	34.1	.8
PVC1082	.82	1.600	.650	1.344	.032	40.6	16.5	34.1	.8
PVC11	1.00	1.600	.700	1.344	.032	40.6	17.8	34.1	.8
200VDC/140VAC									
PVC211	.010	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC2115	.015	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC2118	.018	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC212	.020	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC2122	.022	.700	.330	.500	.032	17.8	8.4	12.7	.8

PVC Series - **Polyester Film / Foil (to 1000V)** **Polypropylene Film / Foil (1200 - 2000V)**

MALLORY

Catalog Number	Cap µF	Inches				Millimeters			
		L Max	Dia Max	S Lead Spacing	Ød	L Max	Dia Max	S Lead Spacing	Ød
200VDC/140VAC									
PVC2133	.033	.900	.380	.688	.032	22.9	9.7	17.5	.8
PVC2139	.039	.900	.380	.688	.032	22.9	9.7	17.5	.8
PVC214	.040	.900	.380	.688	.032	22.9	9.7	17.5	.8
PVC2147	.047	.900	.380	.688	.032	22.9	9.7	17.5	.8
PVC215	.050	.900	.380	.688	.032	22.9	9.7	17.5	.8
PVC2156	.056	1.200	.380	.969	.032	30.5	9.7	24.6	.8
PVC2168	.068	1.200	.380	.969	.032	30.5	9.7	24.6	.8
PVC2182	.082	1.200	.400	.969	.032	30.5	10.2	24.6	.8
PVC201	.10	1.200	.400	.969	.032	30.5	10.2	24.6	.8
PVC2015	.15	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC2022	.22	1.200	.500	.969	.032	30.5	12.7	24.6	.8
PVC2025	.25	1.200	.500	.969	.032	30.5	12.7	24.6	.8
PVC2027	.27	1.600	.470	1.344	.032	40.6	11.9	34.1	.8
PVC2033	.33	1.600	.470	1.344	.032	40.6	11.9	34.1	.8
PVC2047	.47	1.600	.560	1.344	.032	40.6	14.2	34.1	.8
PVC205	.50	1.600	.560	1.344	.032	40.6	14.2	34.1	.8
400VDC/200VAC									
PVC421	.0010	.700	.300	.500	.032	17.8	7.6	12.7	.8
PVC4222	.0022	.700	.300	.500	.032	17.8	7.6	12.7	.8
PVC4233	.0033	.700	.300	.500	.032	17.8	7.6	12.7	.8
PVC4247	.0047	.700	.300	.500	.032	17.8	7.6	12.7	.8
PVC4268	.0068	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC411	.010	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC412	.020	.900	.390	.688	.032	22.9	9.9	17.5	.8
PVC4133	.033	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC4147	.047	1.200	.400	.969	.032	30.5	10.2	24.6	.8
PVC415	.050	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC4156	.056	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC4168	.068	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC4182	.082	1.200	.520	.969	.032	30.5	13.2	24.6	.8
PVC401	.10	1.200	.530	.969	.032	30.5	13.5	24.6	.8
PVC4015	.15	1.200	.570	.969	.032	30.5	14.5	24.6	.8
PVC4018	.18	1.600	.600	1.344	.032	40.6	15.2	34.1	.8
PVC4022	.22	1.600	.600	1.344	.032	40.6	15.2	34.1	.8
PVC4025	.25	1.600	.650	1.344	.032	40.6	16.5	34.1	.8
PVC4033	.33	1.600	.650	1.344	.032	40.6	16.5	34.1	.8
PVC4039	.39	1.600	.720	1.344	.032	40.6	18.3	34.1	.8
PVC4047	.47	1.600	.800	1.344	.032	40.6	20.3	34.1	.8
600VDC/200VAC									
PVC621	.0010	.700	.300	.500	.032	17.8	7.6	12.7	.8
PVC6212	.0012	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC6215	.0015	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC6218	.0018	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC622	.0020	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC6222	.0022	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC6225	.0025	.700	.340	.500	.032	17.8	8.6	12.7	.8
PVC6227	.0027	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC623	.0030	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC6233	.0033	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC6239	.0039	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC624	.0040	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC6247	.0047	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC625	.0050	.700	.380	.500	.032	17.8	9.7	12.7	.8
PVC6256	.0056	.700	.400	.500	.032	17.8	10.2	12.7	.8
PVC626	.006	.700	.400	.500	.032	17.8	10.2	12.7	.8
PVC6268	.0068	.700	.400	.500	.032	17.8	10.2	12.7	.8
PVC6275	.0075	.700	.400	.500	.032	17.8	10.2	12.7	.8
PVC628	.0080	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC6282	.0082	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC611	.010	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC6112	.012	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC6115	.015	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC6118	.018	.900	.450	.688	.032	22.9	11.4	17.5	.8
PVC612	.020	.900	.450	.688	.032	22.9	11.4	17.5	.8
PVC6122	.022	.900	.450	.688	.032	22.9	11.4	17.5	.8
PVC6125	.025	.900	.450	.688	.032	22.9	11.4	17.5	.8

PVC Series - **Polyester Film / Foil (to 1000V)**
Polypropylene Film / Foil (1200 - 2000V)

MALLORY

Catalog Number	Cap µF	Inches				Millimeters			
		L Max	Dia Max	S Lead Spacing	Ød	L Max	Dia Max	S Lead Spacing	Ød
600VDC/200VAC									
PVC6127	.027	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC613	.030	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC6133	.033	1.200	.450	.969	.032	30.5	11.4	24.6	.8
PVC6139	.039	1.200	.560	.969	.032	30.5	14.2	24.6	.8
PVC614	.040	1.200	.560	.969	.032	30.5	14.2	24.6	.8
PVC6147	.047	1.200	.560	.969	.032	30.5	14.2	24.6	.8
PVC615	.050	1.200	.560	.969	.032	30.5	14.2	24.6	.8
PVC6156	.056	1.200	.600	.969	.032	30.5	15.2	24.6	.8
PVC6168	.068	1.200	.600	.969	.032	30.5	15.2	24.6	.8
PVC6182	.082	1.200	.650	.969	.032	30.5	16.5	24.6	.8
PVC601	.10	1.200	.650	.969	.032	30.5	16.5	24.6	.8
PVC6012	.12	1.600	.700	1.344	.032	40.6	17.8	34.1	.8
PVC6015	.15	1.600	.700	1.344	.032	40.6	17.8	34.1	.8
PVC6018	.18	1.600	.800	1.344	.032	40.6	20.3	34.1	.8
PVC602	.20	1.600	.800	1.344	.032	40.6	20.3	34.1	.8
PVC6022	.22	1.600	.800	1.344	.032	40.6	20.3	34.1	.8
PVC6025	.25	1.600	.800	1.344	.032	40.6	20.3	34.1	.8
PVC6033	.33	1.810	.890	1.531	.032	46.0	22.6	38.9	.8
1000VDC/200VAC									
PVC1021	.0010	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC10215	.0015	.700	.330	.500	.032	17.8	8.4	12.7	.8
PVC10218	.0018	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC10222	.0022	.700	.350	.500	.032	17.8	8.9	12.7	.8
PVC10233	.0033	.900	.350	.688	.032	22.9	8.9	17.5	.8
PVC10247	.0047	.900	.400	.688	.032	22.9	10.2	17.5	.8
PVC10256	.0056	.900	.430	.688	.032	22.9	10.9	17.5	.8
PVC10268	.0068	.900	.430	.688	.032	22.9	10.9	17.5	.8
PVC10282	.0082	.900	.480	.688	.032	22.9	12.2	17.5	.8
PVC1011	.010	.900	.480	.688	.032	22.9	12.2	17.5	.8
PVC10115	.015	1.200	.480	.969	.032	30.5	12.2	24.6	.8
PVC10118	.018	1.200	.580	.969	.032	30.5	14.7	24.6	.8
PVC10122	.022	1.200	.580	.969	.032	30.5	14.7	24.6	.8
PVC10127	.027	1.200	.650	.969	.032	30.5	16.5	24.6	.8
PVC10133	.033	1.200	.650	.969	.032	30.5	16.5	24.6	.8
PVC10139	.039	1.600	.650	1.344	.032	40.6	16.5	34.1	.8
PVC10147	.047	1.600	.650	1.344	.032	40.6	16.5	34.1	.8
PVC10156	.056	1.600	.750	1.344	.032	40.6	19.1	34.1	.8
PVC10168	.068	1.600	.750	1.344	.032	40.6	19.1	34.1	.8
PVC10182	.082	1.600	.850	1.344	.032	40.6	21.6	34.1	.8
PVC10010	.10	1.600	.850	1.344	.032	40.6	21.6	34.1	.8
1200VDC/475VAC									
PVC1221	.0010	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC12212	.0012	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC12215	.0015	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC12218	.0018	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC12222	.0022	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC12227	.0027	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC12233	.0033	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC12239	.0039	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC12247	.0047	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC12256	.0056	1.250	.440	.969	.032	31.8	11.2	24.6	.8
PVC12268	.0068	1.250	.470	.969	.032	31.8	11.9	24.6	.8
PVC12282	.0082	1.250	.500	.969	.032	31.8	12.7	24.6	.8
PVC1211	.010	1.250	.530	.969	.032	31.8	13.5	24.6	.8
PVC12112	.012	1.250	.570	.969	.032	31.8	14.5	24.6	.8
PVC12115	.015	1.250	.610	.969	.032	31.8	15.5	24.6	.8
PVC12118	.018	1.650	.560	1.344	.032	41.9	14.2	34.1	.8
PVC12122	.022	1.650	.600	1.344	.032	41.9	15.2	34.1	.8
PVC12127	.027	1.650	.650	1.344	.032	41.9	16.5	34.1	.8
PVC12133	.033	1.650	.700	1.344	.032	41.9	17.8	34.1	.8
PVC12139	.039	1.650	.740	1.344	.032	41.9	18.8	34.1	.8
PVC12147	.047	1.650	.800	1.344	.032	41.9	20.3	34.1	.8

PVC Series - **Polyester Film / Foil (to 1000V)** **Polypropylene Film / Foil (1200 - 2000V)**

MALLORY

Catalog Number	Cap µF	Inches				Millimeters			
		L Max	Dia Max	S Lead Spacing	Ød	L Max	Dia Max	S Lead Spacing	Ød
1600VDC/475VAC									
PVC1621	.0010	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC16215	.0015	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC16222	.0022	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC16227	.0027	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC1623	.0030	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC16233	.0033	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC1624	.0040	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC16247	.0047	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC1625	.0050	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC1626	.0060	1.250	.440	.969	.032	31.8	11.2	24.6	.8
PVC16268	.0068	1.250	.470	.969	.032	31.8	11.9	24.6	.8
PVC1627	.0070	1.250	.500	.969	.032	31.8	12.7	24.6	.8
PVC16275	.0075	1.250	.500	.969	.032	31.8	12.7	24.6	.8
PVC1628	.0080	1.250	.500	.969	.032	31.8	12.7	24.6	.8
PVC16282	.0082	1.250	.500	.969	.032	31.8	12.7	24.6	.8
PVC1611	.010	1.250	.530	.969	.032	31.8	13.5	24.6	.8
PVC16115	.015	1.250	.610	1.344	.032	33.8	15.5	34.1	.8
PVC1612	.020	1.650	.600	1.344	.032	41.9	15.2	34.1	.8
PVC16122	.022	1.650	.600	1.344	.032	41.9	15.2	34.1	.8
PVC16133	.033	1.650	.700	1.344	.032	41.9	17.8	34.1	.8
PVC16147	.047	1.650	.800	1.344	.032	41.9	20.3	34.1	.8
PVC1615	.050	1.650	.850	1.344	.032	41.9	21.6	34.1	.8
2000VDC/500VAC									
PVC2X21	.0010	1.250	.330	.969	.032	31.8	8.4	24.6	.8
PVC2X212	.0012	1.250	.340	.969	.032	31.8	8.6	24.6	.8
PVC2X215	.0015	1.250	.360	.969	.032	31.8	9.1	24.6	.8
PVC2X218	.0018	1.250	.380	.969	.032	31.8	9.7	24.6	.8
PVC2X222	.0022	1.250	.390	.969	.032	31.8	9.9	24.6	.8
PVC2X227	.0027	1.250	.420	.969	.032	31.8	10.7	24.6	.8
PVC2X233	.0033	1.250	.440	.969	.032	31.8	11.2	24.6	.8
PVC2X239	.0039	1.250	.470	.969	.032	31.8	11.9	24.6	.8
PVC2X247	.0047	1.250	.500	.969	.032	31.8	12.7	24.6	.8
PVC2X256	.0056	1.250	.530	.969	.032	31.8	13.5	24.6	.8
PVC2X268	.0068	1.250	.560	.969	.032	31.8	14.2	24.6	.8
PVC2X282	.0082	1.250	.600	.969	.032	31.8	15.2	24.6	.8
PVC2X11	.010	1.250	.650	.969	.032	31.8	16.5	24.6	.8
PVC2X112	.012	1.650	.580	1.344	.032	41.9	14.7	34.1	.8
PVC2X115	.015	1.650	.630	1.344	.032	41.9	16.0	34.1	.8
PVC2X118	.018	1.650	.670	1.344	.032	41.9	17.0	34.1	.8
PVC2X122	.022	1.650	.730	1.344	.032	41.9	18.5	34.1	.8
PVC2X127	.027	1.650	.780	1.344	.032	41.9	19.8	34.1	.8
PVC2X133	.033	1.650	.850	1.344	.032	41.9	21.6	34.1	.8

PHC Series
High Voltage Polypropylene Film / Foil Compact Design

NEW

MALLORY

- Ultimate for high pulse and high RMS current
- Pressed profile compact design for best utilization of board space
- Ideal in high frequency, snubber, resonant, and switching applications
- Very low dissipation factor

GENERAL SPECIFICATIONS

Operating Temperature:
-55° C to +85° C
(+105° C with voltage derated @ 50%)

Voltage Range:
1000 VDC/450 VAC
2000 VDC/500 VAC

Capacitance Range:
220pF to 0.033μF

Capacitance tolerance:
±5%

Construction:
Non-inductively wound with extended foil

Lead Material:
Tinned copper
.032" (.8mm) dim.

Encapsulation:
Conformal coating of flame retardant epoxy (meets UL94V-2)

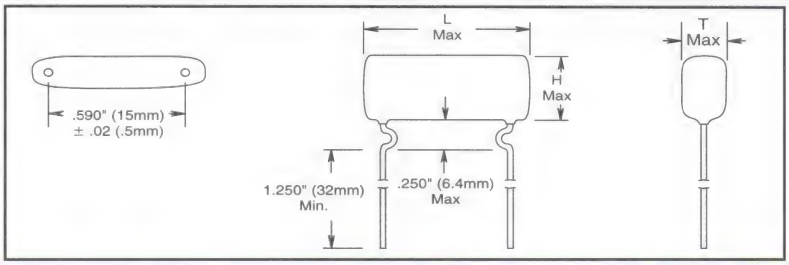
Dielectric:
Polypropylene film; utilizing a floating common of metallized polypropylene characteristics, which provides self-healing

Insulation Resistance:
400,000 MΩ minimum @+25° C
20,000 MΩ minimum @+85° C
2,000 MΩ minimum @+105° C

Corona Start Voltage (typical):
1000 VDC units: 600 Volts RMS
2000 VDC units: 650 Volts RMS

Maximum Dissipation Factor (%):

	@20kHz	@100kHz
1000 VDC	.032	.054
2000 VDC	.029	.040

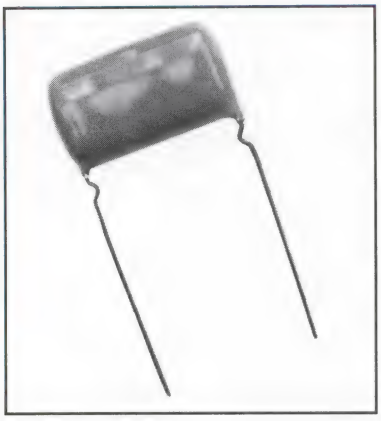


Part Number	Cap μF	Max dV/dt (Volts/μsec)	Inches L Max	T Max	H Max	Seated Height	Nom. L.S.	Millimeters L Max	T Max	H Max	Seated Height	Nom. L.S.
1000 VDC/450 VAC												
PHC10382J	.00082	47500	.850	.250	.340	.590	.590	21.6	6.4	8.6	12.7	15.0
PHC1021J	.0010	43000	.850	.250	.360	.610	.590	21.6	6.4	9.1	15.5	15.0
PHC10212J	.0012	39300	.850	.260	.360	.610	.590	21.6	3.3	9.1	15.5	15.0
PHC10215J	.0015	35100	.850	.250	.370	.620	.590	21.6	6.4	9.4	15.7	15.0
PHC10218J	.0018	32100	.850	.240	.370	.620	.590	21.6	6.1	9.4	15.7	15.0
PHC10222J	.0022	29000	.850	.250	.380	.630	.590	21.6	6.4	9.7	16.0	15.0
PHC10227J	.0027	26200	.850	.270	.400	.650	.590	21.6	6.9	10.2	16.5	15.0
PHC10233J	.0033	23700	.850	.260	.460	.710	.590	21.6	6.6	11.7	18.0	15.0
PHC10239J	.0039	21800	.850	.270	.480	.730	.590	21.6	6.9	12.2	18.5	15.0
PHC10247J	.0047	19900	.850	.290	.500	.750	.590	21.6	7.4	12.7	19.1	15.0
PHC10256J	.0056	18200	.850	.310	.520	.770	.590	21.6	7.9	13.2	19.6	15.0
PHC10268J	.0068	16500	.850	.340	.550	.800	.590	21.6	8.6	13.9	20.3	15.0
PHC10282J	.0082	15000	.850	.340	.580	.830	.590	21.6	8.6	14.7	21.1	15.0
PHC1011J	.0100	13600	.850	.350	.640	.890	.590	21.6	8.9	16.3	22.6	15.0
PHC10112J	.0120	12400	.850	.380	.670	.920	.590	21.6	9.7	17.0	23.4	15.0
PHC10115J	.0150	11100	.850	.430	.720	.970	.590	21.6	10.9	18.2	24.6	15.0
PHC10118J	.0180	10100	.850	.470	.770	1.020	.590	21.6	11.9	19.6	25.9	15.0
PHC10122J	.0220	9200	.850	.490	.840	1.090	.590	21.6	12.4	21.3	27.7	15.0
PHC10127J	.0270	8300	.850	.550	.900	1.150	.590	21.6	14.0	22.9	29.2	15.0
PHC10133J	.0330	7500	.850	.620	.970	1.220	.590	21.6	15.7	24.6	31.0	15.0
2000 VDC/500 VAC												
PHC20322J	.00022	102000	.850	.250	.380	.630	.590	21.6	6.4	9.7	16.0	15.0
PHC20327J	.00027	92100	.850	.260	.390	.640	.590	21.6	6.6	9.9	16.3	15.0
PHC20333J	.00033	83300	.850	.250	.390	.640	.590	21.6	6.4	9.9	16.3	15.0
PHC20339J	.00039	76600	.850	.260	.390	.640	.590	21.6	6.6	9.9	16.3	15.0
PHC20347J	.00047	69600	.850	.260	.390	.640	.590	21.6	6.6	9.9	16.3	15.0
PHC20356J	.00056	63900	.850	.270	.400	.650	.590	21.6	6.9	10.2	16.5	15.0
PHC20368J	.00068	58000	.850	.280	.410	.660	.590	21.6	7.4	12.7	19.1	15.0
PHC20382J	.00082	52800	.850	.270	.480	.730	.590	21.6	6.9	12.2	18.5	15.0
PHC2021J	.0010	47800	.850	.290	.500	.750	.590	21.6	7.4	12.7	19.1	15.0
PHC20215J	.0015	39100	.850	.330	.540	.790	.590	21.6	8.4	13.7	20.1	15.0
PHC20218J	.0018	35700	.850	.350	.560	.810	.590	21.6	8.9	14.2	20.6	15.0
PHC20222J	.0022	32200	.850	.380	.590	.840	.590	21.6	9.7	15.0	21.3	15.0
PHC20227J	.0027	29100	.850	.380	.620	.870	.590	21.6	9.7	15.7	22.1	15.0
PHC20233J	.0033	26300	.850	.390	.680	.930	.590	21.6	9.9	17.3	23.6	15.0
PHC20239J	.0039	24200	.850	.420	.710	.960	.590	21.6	10.7	18.0	24.4	15.0
PHC20247J	.0047	22100	.850	.460	.750	1.000	.590	21.6	11.7	19.1	25.4	15.0
PHC20256J	.0056	20200	.850	.470	.820	1.070	.590	21.6	12.0	20.1	27.2	15.0
PHC20268J	.0068	18300	.850	.520	.870	1.120	.590	21.6	13.2	22.1	28.4	15.0
PHC20282J	.0082	16700	.850	.570	.920	1.170	.590	21.6	14.5	23.4	30.0	15.0
PHC2011J	.0100	15100	.850	.630	.980	1.230	.590	21.6	16.0	25.0	31.2	15.0

PHV Series
High AC Voltage Polypropylene Film / Foil

NEW

MALLORY



- Designed for high AC voltage applications requiring corona free performance
- Very low dissipation factor
- Ideal in high frequency, high pulse current applications; high dv/dt rating
- Excellent stability, virtually linear temperature coefficient
- Applications include: switching and high voltage power supplies, inverters, snubbers, resonant converters and electronic lighting ballasts

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +85°C
(+105°C with voltage derating)

Voltage Range:
800 VAC/1800 VDC
900 VAC/2000 VDC

Capacitance Range:
470pF to 0.015μF

Capacitance Tolerance: ±5%

Construction:
Non-inductively wound with extended foil, internal series-section design

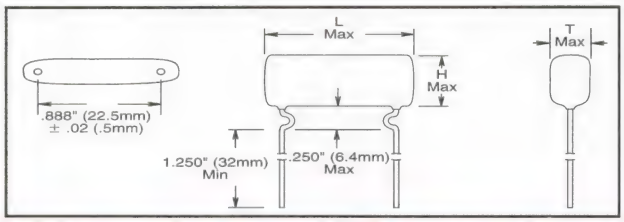
Lead Material:
Tinned copper clad steel
.032" (.8mm) dim.

Encapsulation:
Conformal coating of flame retardant epoxy (meets UL94V-2)

Dielectric:
Polypropylene film; utilizing a floating common of metallized polypropylene, which provides self-healing characteristics

Insulation Resistance:
400,000 MΩ minimum @+25°C
20,000 MΩ minimum @+85°C
2,000 MΩ minimum @+105°C

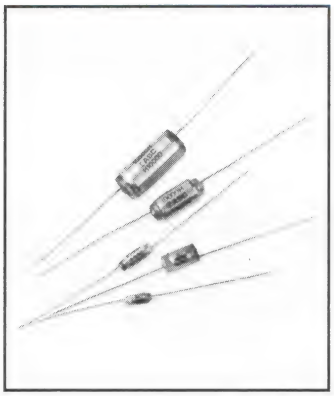
Corona Start Voltage (typical):
800 VAC units: 950-1000 Volts RMS
900 VAC units: 1050-1100 Volts RMS



Part Number	Cap μF	Max dV/dt (Volts/μsec)	Max% D.F. @ 20kHz	Max% D.F. @ 100kHz	Inches L Max	Inches T Max	Inches H Max	Inches Seated Height	Inches Nom. L.S.	Millimeters L Max	Millimeters T Max	Millimeters H Max	Millimeters Seated Height	Millimeters Nom. L.S.
800 VAC/1800 VDC														
PHV8347J	.00047	95000	.029	.039	1.125	.210	.390	.640	.886	28.5	5.4	9.9	16.3	22.5
PHV8356J	.00056	87000	.029	.040	1.125	.220	.400	.650	.886	28.5	5.6	10.2	16.5	22.5
PHV8368J	.00068	79000	.029	.040	1.125	.240	.420	.670	.886	28.5	6.1	10.7	17.0	22.5
PHV8382J	.00082	72000	.030	.043	1.125	.200	.380	.630	.886	28.5	5.1	9.7	16.0	22.5
PHV821J	.0010	65000	.030	.043	1.125	.200	.380	.630	.886	28.5	5.1	9.7	16.0	22.5
PHV8212J	.0012	60000	.030	.044	1.125	.210	.390	.640	.886	28.5	5.3	9.9	16.3	22.5
PHV8215J	.0015	53000	.030	.044	1.125	.230	.410	.660	.886	28.5	5.9	10.4	16.8	22.5
PHV8218J	.0018	49000	.030	.044	1.125	.240	.420	.670	.886	28.5	6.1	10.7	17.0	22.5
PHV8222J	.0022	44000	.030	.045	1.125	.250	.450	.700	.886	28.5	6.4	11.4	17.8	22.5
PHV8227J	.0027	40000	.030	.045	1.125	.270	.470	.720	.886	28.5	6.9	11.9	18.3	22.5
PHV8233J	.0033	36000	.031	.046	1.125	.290	.500	.750	.886	28.5	7.4	12.7	19.1	22.5
PHV8239J	.0039	33000	.031	.046	1.125	.290	.550	.800	.886	28.5	7.4	14.0	20.3	22.5
PHV8247J	.0047	30000	.031	.047	1.125	.320	.570	.820	.886	28.5	8.1	14.5	20.8	22.5
PHV8256J	.0056	28000	.031	.048	1.125	.340	.600	.850	.886	28.5	8.6	15.3	21.6	22.5
PHV8268J	.0068	25000	.031	.049	1.125	.380	.630	.880	.886	28.5	9.7	16.0	22.4	22.5
PHV8282J	.0082	23000	.031	.051	1.125	.390	.690	.940	.886	28.5	9.9	17.5	23.9	22.5
PHV801J	.0100	21000	.032	.053	1.125	.430	.730	.980	.886	28.5	10.9	18.5	24.9	22.5
PHV812J	.0120	19000	.032	.055	1.125	.440	.790	1.040	.886	28.5	11.2	20.1	26.4	22.5
PHV815J	.0150	17000	.033	.058	1.125	.500	.850	1.100	.886	28.5	12.7	21.6	27.9	22.5
900 VAC/2000 VDC														
PHV9347J	.00047	104000	.031	.043	1.250	.200	.370	.620	.886	31.8	5.1	9.4	15.8	22.5
PHV9356J	.00056	95000	.031	.043	1.250	.210	.380	.630	.886	31.8	5.4	9.7	16.0	22.5
PHV9368J	.00068	86000	.031	.043	1.250	.230	.390	.640	.886	31.8	5.9	9.9	16.3	22.5
PHV9382J	.00082	78000	.031	.043	1.250	.230	.400	.650	.886	31.8	5.9	10.2	16.5	22.5
PHV921J	.0010	71000	.031	.043	1.250	.230	.430	.680	.886	31.8	5.9	10.9	17.3	22.5
PHV9212J	.0012	65000	.031	.043	1.250	.250	.440	.690	.886	31.8	6.4	11.2	17.5	22.5
PHV9215J	.0015	58000	.031	.044	1.250	.270	.470	.720	.886	31.8	6.9	11.9	18.3	22.5
PHV9218J	.0018	53000	.031	.044	1.250	.270	.520	.770	.886	31.8	6.9	13.2	19.6	22.5
PHV9222J	.0022	48000	.031	.044	1.250	.300	.540	.790	.886	31.8	7.6	13.7	20.1	22.5
PHV9227J	.0027	43000	.031	.044	1.250	.320	.570	.820	.886	31.8	8.1	14.5	20.8	22.5
PHV9233J	.0033	39000	.031	.046	1.250	.330	.630	.880	.886	31.8	8.4	16.0	22.4	22.5
PHV9239J	.0039	36000	.031	.046	1.250	.360	.660	.910	.886	31.8	9.2	16.8	23.1	22.5
PHV9247J	.0047	33000	.031	.047	1.250	.390	.690	.940	.886	31.8	9.9	17.5	23.9	22.5
PHV9256J	.0056	30000	.031	.048	1.250	.430	.730	.980	.886	31.8	10.9	18.5	24.9	22.5
PHV9268J	.0068	27000	.031	.049	1.250	.470	.780	1.030	.886	31.8	11.9	19.8	26.2	22.5
PHV9282J	.0082	25000	.032	.051	1.250	.490	.850	1.100	.886	31.8	12.5	21.6	27.9	22.5
PHV901J	.0100	23000	.032	.052	1.250	.540	.910	1.160	.886	31.8	13.7	23.1	29.5	22.5

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

SX Series
Polystyrene-Foil / Axial Leads



- Axial Leads
- High Q and Excellent Stability
- High Insulation, Low Absorption
- Low Dissipation Factor, Tight Temperature Coefficient
- Lead Material
  Solder Coated or Tinned
  Solid Wire

GENERAL SPECIFICATIONS

Operating Temperature:
-40° C to +70° C
(Derate 0.67% per °C above 40° C)

Voltage Range:
40° C - 33 VDC to 630 VDC
70° C - 25 VDC to 500 VDC

Capacitance Range:
20 pF to .027 μF

Tolerance Range:
±2.5%, ±5.0%, ±10.0%

Total Self Inductance:
Body: 10 to 30 nH, function of the body length
Leads: 10 nH/cm of length

Dielectric Withstand Voltage:
2.5 x Rated Voltage for 5 seconds
Charge and discharge current ≤ 50 mA

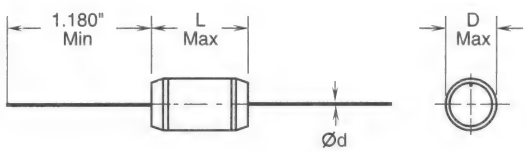
Dissipation Factor (DF):
Shall not be > .05%

Ideally suited for precision circuits such as sample and hold, dual Slope Integration and Temperature Compensation

Temperature Coefficient

For 33 VDC:
-125 ± 75 PPM/°C
For 63, 160, 630 VDC
Capacitance Values ≤ 500 pF -175 ± 75 PPM/°C Capacitance Values > 500 pF -125 ± 75 PPM/°C

Outline Dimensions



Specifications

Insulation Resistance (IR)
Shall be less than:
50,000 MΩ or 1000/C (MΩ) (C in MFD) whichever is lower for 33 VDC at 10 VDC
100,000 MΩ or 2000/C (MΩ) (C in MFD) whichever is lower for 63 VDC at 10 VDC
500,000 MΩ or 10,000/C (MΩ) (C in MFD) whichever is lower for 160 to 630 VDC at 100 VDC

Dielectric Absorbtion:
Equal to or less than .02%

Capacitance Drift:
Equal to or less than ± 0.3% + 0.4 pF after thermal cycle from +25°C to -25°C to +70°C and back to +25°C

Storage:
ΔC/C ≤ ± 0.5% +.4pF for SXK, SXL
ΔC/C ≤ ± 0.2% +.4pF for SXM, SX
When stored in constant climate ≤ 70% RH within operating temperature range and stabilized at 40% RH 25°C ± 5°C for 24 hours before measurements

Life Test:
125% of rated voltage for 250 hrs at 70°C

Soldering Conditions:
Not recommended for wave soldering
For manual soldering:
Solder Temperature: 270°C
Time: 4 seconds maximum
Distance from body: .236 inches minimum
Caution:
Exposure to temperatures > 70°C will result in serious degradation
Clean with de-ionized water only. Do not expose to solvents.

SX Series
Polystyrene-Foil / Axial Leads

MALLORY

Old Catalog Number	Cap pF	% Tol.	Millimeters D Max.	L Max.	Ød	New Catalog Number	% Tol.	Millimeters D Max.	L Max.	Ød
33 WVDC @ +40°C 25 WVDC @ +70°C										
SXK310	100	2.5	4.6	8.0	.3	SXK310A	5.0	5.5	12.0	.4
SXK312	120	2.5	4.6	8.0	.3	SXK312A	5.0	5.5	12.0	.4
SXK318	180	2.5	4.6	8.0	.3	SXK318A	5.0	5.5	12.0	.4
SXK322	220	2.5	4.6	8.0	.3	SXK322A	5.0	5.5	12.0	.4
SXK327	270	2.5	4.6	8.0	.3	SXK327A	5.0	5.5	12.0	.4
SXK333	330	2.5	4.6	8.0	.3	SXK333A	5.0	5.5	12.0	.4
SXK339	390	2.5	4.6	8.0	.3	SXK339A	5.0	5.5	12.0	.4
SXK347	470	2.5	4.6	8.0	.3	SXK347A	2.5	5.5	12.0	.4
SXK356	560	2.5	4.6	8.0	.3	SXK356A	2.5	5.5	12.0	.4
SXK368	680	2.5	4.6	8.0	.3	SXK368A	2.5	5.5	12.0	.4
SXK382	820	2.5	4.6	8.0	.3	SXK382A	2.5	6.0	12.0	.4
SXK210	1000	2.5	4.6	8.0	.3	SXK210A	2.5	6.0	12.0	.4
SXK212	1200	2.5	6.6	12.0	.4	SXK212A	2.5	7.0	12.0	.4
SXK215	1500	2.5	6.6	12.0	.4	SXK215A	2.5	7.0	12.0	.4
SXK218	1800	2.5	6.6	12.0	.4	SXK218A	2.5	7.0	12.0	.4
SXK222	2200	2.5	6.6	12.0	.4	SXK222A	2.5	7.0	12.0	.4
SXK227	2700	2.5	6.6	12.0	.4	SXK227A	2.5	7.0	12.0	.4
SXK233	3300	2.5	6.6	12.0	.4	SXK233A	2.5	7.0	12.0	.4
SXK239	3900	2.5	6.6	12.0	.4	SXK239A	2.5	7.5	12.0	.4
SXK247	4700	2.5	6.6	12.0	.4	SXK247A	2.5	8.0	12.0	.4
SXK256	5600	2.5	11.9	17.0	.5	SXK256A	2.5	10.0	12.0	.4
SXK268	6800	2.5	11.9	17.0	.5	SXK268A	2.5	10.0	15.0	.4
SXK282	8200	2.5	11.9	17.0	.5	SXK282A	2.5	11.0	15.0	.4
SXK110	10,000	2.5	11.9	17.0	.5	SXK110A	2.5	11.0	15.0	.4
SXK112	12,000	2.5	11.9	17.0	.5	**Not Available**				
SXK115	15,000	2.5	11.9	17.0	.5	**Not Available**				
SXK118	18,000	2.5	11.9	17.0	.5	SXK118A	2.5	12.0	17.0	.5
SXK122	22,000	2.5	11.9	17.0	.5	SXK122A	2.5	12.0	17.0	.5
SXK125	25,000	2.5	11.9	17.0	.5	**Not Available**				
SXK127	27,000	2.5	11.9	17.0	.5	SXK127A	2.5	12.0	17.0	.5
SXK133	33,000	2.5	18.0	22.0	.5	**Not Available**				
SXK139	39,000	2.5	18.0	22.0	.5	**Not Available**				
SXK147	47,000	2.5	18.0	22.0	.5	**Not Available**				
SXK156	56,000	2.5	18.0	22.0	.5	**Not Available**				
SXK168	68,000	2.5	18.0	22.0	.5	**Not Available**				
SXK182	82,000	2.5	18.0	22.0	.5	**Not Available**				
SXK010	.1μF	2.5	18.0	22.0	.5	**Not Available**				

Old Catalog Number	Cap pF	% Tol.	Millimeters D Max.	L Max.	Ød	New Catalog Number	% Tol.	Millimeters D Max.	L Max.	Ød
63 WVDC @ +40°C 50 WVDC @ +70°C										
SXL482	82	2.5	4.8	8.0	.3	**Not Available**				
SXL310	100	2.5	4.8	8.0	.3	SXL310A	5.0	6.0	12.0	.4
SXL315	150	2.5	4.8	8.0	.3	SXL315A	5.0	6.0	12.0	.4
SXL318	180	2.5	4.8	8.0	.3	SXL318A	5.0	5.5	12.0	.4
SXL322	220	2.5	4.8	8.0	.3	SXL322A	5.0	5.5	12.0	.4
SXL327	270	2.5	4.8	8.0	.3	SXL327A	5.0	5.5	12.0	.4
SXL333	330	2.5	4.8	8.0	3	SXL333A	5.0	5.5	12.0	.4
SXL347	470	2.5	4.8	8.0	.3	SXL347A	2.5	5.5	12.0	.4
SXL356	560	2.5	4.8	8.0	.3	SXL356A	2.5	5.5	12.0	.4
SXL368	680	2.5	4.8	8.0	.3	SXL368A	2.5	5.5	12.0	.4
SXL210	1000	2.5	8.4	12.0	.3	SXL210A	2.5	6.0	12.0	.4
SXL212	1200	2.5	8.4	12.0	.4	SXL212A	2.5	7.0	12.0	.4
SXL215	1500	2.5	8.4	12.0	.4	SXL215A	2.5	7.0	12.0	.4
SXL218	1800	2.5	8.4	12.0	.4	SXL218A	2.5	7.0	12.0	.4
SXL222	2200	2.5	8.4	12.0	.4	SXL222A	2.5	7.0	12.0	.4
SXL227	2700	2.5	8.4	12.0	.4	SXL227A	2.5	7.0	12.0	.4
SXL233	3300	2.5	8.4	12.0	.4	SXL233A	2.5	7.0	12.0	.4
SXL239	3900	2.5	8.4	12.0	.4	SXL239A	2.5	7.5	12.0	.4
SXL247	4700	2.5	8.4	12.0	.4	SXL247A	2.5	10.0	12.0	.4
SXL256	5600	2.5	8.6	17.0	.5	SXL256A	2.5	10.0	12.0	.4
SXL268	6800	2.5	8.6	17.0	.5	SXL268A	2.5	10.0	15.0	.4
SXL282	8200	2.5	8.6	17.0	.5	SXL282A	2.5	11.0	15.0	.4
SXL110	10,000	2.5	8.6	17.0	.5	SXL110A	2.5	11.0	15.0	.4
SXL112	12,000	2.5	10.9	22.0	.5	**Not Available**				
SXL115	15,000	2.5	10.9	22.0	.5	SXL115A	2.5	2.0	17.0	.5
SXL116	16,000	2.5	10.9	22.0	.5	**Not Available**				
SXL120	20,000	2.5	10.9	22.0	.5	**Not Available**				
SXL122	22,000	2.5	10.9	22.0	.5	**Not Available**				

SX Series
Polystyrene-Foil / Axial Leads

MALLORY

Old Catalog Number	Cap pF	% Tol.	Millimeters D Max.	L Max.	∅d	New Catalog Number	% Tol.	Millimeters D Max.	L Max.	∅d
160 WVDC @ +40°C 125 WVDC @ +70°C										
SXM420	20	2.5	6.1	8.0	.3	SXM420A	10.0	6.0	12.0	.4
SXM427	27	2.5	6.1	8.0	.3	**Not Available**				
SXM433	33	2.5	6.1	8.0	.3	**Not Available**				
SXM439	39	2.5	6.1	8.0	.3	**Not Available**				
SXM447	47	2.5	6.1	8.0	.3	SXM447A	10.0	6.0	12.0	.4
SXM456	56	2.5	6.1	8.0	.3	**Not Available**				
SXM468	68	2.5	6.1	8.0	.3	**Not Available**				
SXM482	82	2.5	6.1	8.0	.3	**Not Available**				
SXM310	100	2.5	6.1	8.0	.3	SXM310A	5.0	5.5	12.0	.4
SXM312	120	2.5	6.1	8.0	.3	SXM312A	5.0	5.5	12.0	.4
SXM315	150	2.5	6.1	8.0	.3	SXM315A	5.0	5.5	12.0	.4
SXM318	180	2.5	6.1	8.0	.3	SXM318A	5.0	5.5	12.0	.4
SXM322	220	2.5	6.1	8.0	.3	SXM322A	5.0	5.5	12.0	.4
SXM327	270	2.5	6.1	8.0	.3	SXM327A	5.0	5.5	12.0	.4
SXM330	300	2.5	6.1	8.0	.3	SXM330A	5.0	5.5	12.0	.4
SXM333	330	2.5	6.1	8.0	.3	SXM333A	5.0	5.5	12.0	.4
SXM336	360	2.5	6.1	8.0	.3	SXM336A	5.0	5.5	12.0	.4
SXM339	390	2.5	6.1	8.0	.3	SXM339A	5.0	5.5	12.0	.4
SXM343	430	2.5	6.1	8.0	.3	SXM343A	5.0	5.5	12.0	.4
SXM347	470	2.5	6.1	8.0	.3	SXM347A	2.5	5.5	12.0	.4
SXM350	500	2.5	6.1	8.0	.3	SXM350A	2.5	5.5	12.0	.4
SXM351	510	2.5	6.1	8.0	.3	SXM351A	2.5	5.5	12.0	.4
SXM356	560	2.5	6.1	8.0	.3	SXM356A	2.5	5.5	12.0	.4
SXM360	600	2.5	6.1	8.0	.3	SXM360A	2.5	5.5	12.0	.4
SXM362	620	2.5	7.6	12.0	.4	SXM362A	2.5	6.0	12.0	.4
SXM368	680	2.5	7.6	12.0	.4	SXM368A	2.5	6.0	12.0	.4
SXM375	750	2.5	7.6	12.0	.4	SXM375A	2.5	6.0	12.0	.4
SXM382	820	2.5	7.6	12.0	.4	SXM382A	2.5	6.5	12.0	.4
SXM391	910	2.5	7.6	12.0	.4	SXM391A	2.5	7.5	12.0	.4
SXM210	1000	2.5	7.6	12.0	.4	SXM210A	2.5	7.5	12.0	.4
SXM211	1100	2.5	7.6	12.0	.4	SXM211A	2.5	7.5	12.0	.4
SXM212	1200	2.5	7.6	12.0	.4	SXM212A	2.5	7.5	12.0	.4
SXM213	1300	2.5	7.6	12.0	.4	SXM213A	2.5	7.5	12.0	.4
SXM215	1500	2.5	7.6	12.0	.4	SXM215A	2.5	7.5	12.0	.4
SXM216	1600	2.5	7.6	12.0	.4	SXM216A	2.5	7.5	12.0	.4
SXM218	1800	2.5	7.6	12.0	.4	SXM218A	2.5	7.5	12.0	.4
SXM220	2000	2.5	7.6	12.0	.4	SXM220A	2.5	7.5	12.0	.4
SXM222	2200	2.5	9.4	17.0	.5	SXM222A	2.5	7.5	12.0	.4
SXM224	2400	2.5	9.4	17.0	.5	SXM224A	2.5	9.0	12.0	.4
SXM227	2700	2.5	9.4	17.0	.5	SXM227A	2.5	9.0	12.0	.4
SXM230	3000	2.5	9.4	17.0	.5	SXM230A	2.5	9.0	15.0	.4
SXM233	3300	2.5	9.4	17.0	.5	SXM233A	2.5	9.5	15.0	.4
SXM236	3600	2.5	9.4	17.0	.5	SXM236A	2.5	9.5	15.0	.4
SXM239	3900	2.5	9.4	17.0	.5	SXM239A	2.5	9.5	15.0	.4
SXM243	4300	2.5	9.4	17.0	.5	SXM243A	2.5	9.5	15.0	.4
SXM247	4700	2.5	9.4	17.0	.5	SXM247A	2.5	9.5	15.0	.4
SXM250	5000	2.5	9.4	17.0	.5	SXM250A	2.5	9.5	15.0	.4
SXM251	5100	2.5	11.9	22.0	.5	SXM251A	2.5	12.0	16.0	.4
SXM256	5600	2.5	11.9	22.0	.5	SXM256A	2.5	12.0	16.0	.4
SXM262	6200	2.5	11.9	22.0	.5	SXM262A	2.5	12.0	16.0	.4
SXM268	6800	2.5	11.9	22.0	.5	SXM268A	2.5	12.0	16.0	.4
SXM275	7500	2.5	11.9	22.0	.5	SXM275A	2.5	12.0	17.0	.4
SXM282	8200	2.5	11.9	22.0	.5	SXM282A	2.5	12.0	17.0	.4
SXM110	10,000	2.5	11.9	22.0	.5	SXM110A	2.5	12.0	17.0	.4
SXM112	12,000	2.5	11.9	22.0	.5	**Not Available**				
SXM113	13,000	2.5	11.9	22.0	.5	**Not Available**				
SXM115	15,000	2.5	11.9	22.0	.5	**Not Available**				
SXM118	18,000	2.5	13.5	32.0	.5	**Not Available**				
SXM122	22,000	2.5	13.5	32.0	.5	**Not Available**				
SXM124	24,000	2.5	13.5	32.0	.5	**Not Available**				

Old Catalog Number	Cap pF	% Tol.	Millimeters D Max.	L Max.	∅d	New Catalog Number	% Tol.	Millimeters D Max.	L Max.	∅d
630 WVDC @ +40°C 500 WVDC @ +70°C										
SX420	20	5.0	7.1	12.0	.4	SX420A	10.0	6.0	12.0	.4
SX422	22	5.0	7.1	12.0	.4	SX422A	10.0	6.0	12.0	.4
SX424	24	5.0	7.1	12.0	.4	SX424A	10.0	6.0	12.0	.4
SX430	30	5.0	7.1	12.0	.4	SX430A	10.0	6.0	12.0	.4
SX433	33	5.0	7.1	12.0	.4	SX433A	10.0	6.0	12.0	.4
SX436	36	5.0	7.1	12.0	.4	SX436A	10.0	6.0	12.0	.4
SX439	39	5.0	7.1	12.0	.4	SX439A	10.0	6.0	12.0	.4
SX443	43	5.0	7.1	12.0	.4	SX443A	10.0	6.0	12.0	.4
SX447	47	5.0	7.1	12.0	.4	SX447A	10.0	6.0	12.0	.4
SX456	56	5.0	7.1	12.0	.4	SX456A	10.0	6.0	12.0	.4
SX462	62	5.0	7.1	12.0	.4	SX462A	10.0	6.0	12.0	.4
SX468	68	5.0	7.1	12.0	.4	SX468A	10.0	6.0	12.0	.4
SX475	75	5.0	7.1	12.0	.4	**Not Available**				
SX482	82	5.0	7.1	12.0	.4	**Not Available**				
SX491	91	5.0	7.1	12.0	.4	**Not Available**				
SX310	100	5.0	7.1	12.0	.4	SX310A	5.0	5.5	12.0	.4
SX311	110	5.0	7.1	12.0	.4	SX311A	5.0	5.5	12.0	.4
SX312	120	5.0	7.1	12.0	.4	SX312A	5.0	5.5	12.0	.4
SX313	130	5.0	7.1	12.0	.4	SX313A	5.0	5.5	12.0	.4
SX315	150	5.0	7.1	12.0	.4	SX315A	5.0	6.0	12.0	.4
SX318	180	5.0	7.1	12.0	.4	SX318A	5.0	6.0	12.0	.4
SX320	200	5.0	7.1	12.0	.4	SX320A	5.0	6.0	12.0	.4
SX322	220	5.0	7.1	12.0	.4	SX322A	5.0	6.0	12.0	.4
SX324	240	5.0	7.1	12.0	.4	SX324A	5.0	6.0	12.0	.4
SX327	270	5.0	7.1	12.0	.4	SX327A	5.0	6.0	12.0	.4
SX330	300	5.0	7.1	12.0	.4	SX330A	5.0	6.5	12.0	.4
SX333	330	5.0	7.1	12.0	.4	SX333A	5.0	6.5	12.0	.4
SX336	360	5.0	7.1	12.0	.4	SX336A	5.0	6.5	12.0	.4
SX339	390	5.0	7.1	12.0	.4	SX339A	5.0	6.5	12.0	.4
SX343	430	5.0	7.1	12.0	.4	SX343A	5.0	6.5	12.0	.4
SX347	470	5.0	7.1	12.0	.4	SX347A	5.0	7.0	12.0	.4
SX351	510	5.0	10.2	17.0	.5	SX351A	5.0	10.0	12.0	.4
SX356	560	5.0	10.2	17.0	.5	SX356A	5.0	10.0	12.0	.4
SX362	620	5.0	10.2	17.0	.5	SX362A	5.0	10.0	12.0	.4
SX368	680	5.0	10.2	17.0	.5	SX368A	5.0	10.0	12.0	.4
SX375	750	5.0	10.2	17.0	.5	SX375A	5.0	10.0	12.0	.4
SX382	820	5.0	10.2	17.0	.5	SX382A	5.0	10.0	12.0	.4
SX210	1000	5.0	10.2	17.0	.5	SX210A	5.0	10.0	12.0	.4
SX211	1100	5.0	10.2	17.0	.5	SX211A	5.0	10.0	15.0	.4
SX212	1200	5.0	10.2	17.0	.5	SX212A	5.0	10.0	15.0	.4
SX213	1300	5.0	10.2	17.0	.5	SX213A	5.0	10.0	15.0	.4
SX215	1500	5.0	10.2	17.0	.5	SX215A	5.0	10.0	15.0	.4
SX218	1800	5.0	10.2	17.0	.5	SX218A	5.0	10.0	17.0	.4
SX220	2000	5.0	10.2	17.0	.5	SX220A	5.0	10.0	17.0	.4
SX222	2200	5.0	10.2	17.0	.5	SX222A	5.0	10.0	17.0	.4
SX224	2400	5.0	10.2	17.0	.5	SX224A	5.0	10.0	17.0	.4
SX225	2500	5.0	10.2	17.0	.5	SX225A	5.0	10.0	17.0	.4
SX227	2700	5.0	10.2	17.0	.5	SX227A	5.0	10.0	17.0	.4
SX230	3000	5.0	10.2	17.0	.5	SX230A	5.0	10.0	17.0	.4
SX233	3300	5.0	15.0	22.0	.5	SX233A	5.0	10.0	17.0	.4
SX236	3600	5.0	15.0	22.0	.5	SX236A	5.0	10.0	17.0	.4
SX239	3900	5.0	15.0	22.0	.5	SX239A	5.0	10.0	17.0	.4
SX243	4300	5.0	15.0	22.0	.5	SX243A	5.0	10.0	17.0	.4
SX247	4700	5.0	15.0	22.0	.5	SX247A	5.0	15.0	17.0	.5
SX250	5000	5.0	15.0	22.0	.5	SX250A	5.0	15.0	17.0	.5
SX251	5100	5.0	15.0	22.0	.5	SX251A	5.0	15.0	17.0	.5
SX256	5600	5.0	15.0	22.0	.5	SX256A	5.0	15.0	17.0	.5
SX262	6200	5.0	15.0	22.0	.5	SX262A	5.0	15.0	17.0	.5
SX268	6800	5.0	15.0	22.0	.5	SX268A	5.0	15.0	17.0	.5
SX275	7500	5.0	15.0	22.0	.5	SX275A	5.0	15.0	22.0	.5
SX282	8200	5.0	15.0	22.0	.5	SX282A	5.0	15.0	22.0	.5
SX291	9100	5.0	15.0	22.0	.5	SX291A	5.0	15.0	22.0	.5
SX110	10,000	5.0	15.0	22.0	.5	SX110A	5.0	15.0	22.0	.5
SX122	22,000	5.0	18.0	32.0	.5	**Not Available**				

157X Series — Type X2 Suppressor Capacitors
Miniature Metallized Polypropylene / Radial Leads

NEW

MALLORY

- Radial Leads in Two Lengths
- UL-1414 and CSA Approved
- Flame Retardant Case Meets UL94V-0
- Polyurethane End Fill Meets UL94V-0
- Used in applications where damage to the capacitor will not lead to the danger of electrical shock
- Lead Material Tinned Copper Clad Steel

For other X type capacitors see our UN Series Ceramic on page 153

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +100°C

Voltage Range:
275/250 VAC

Capacitance Range:
0.01 μF to 2.2 μF

Capacitance Tolerance:
±10%

Dissipation Factor (DF)
tgδ 0.01 Max at 1,000 ± 100kHz

Insulation Resistance (IR)
(@ 500 VDC and 20°C)
Terminal to Terminal:
15,000 MΩ min
Both Terminals to Body:
300,000 MΩ min

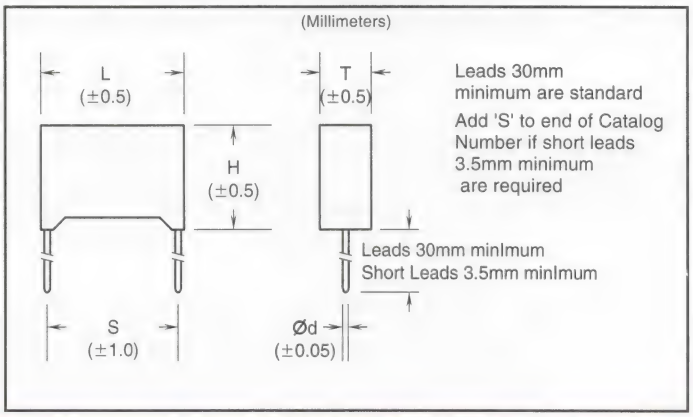
Maximum Pulse Rise Time

μF	V/μs	μF	V/μs
.01	2800	.22	1200
.022	2400	.47	1000
.033	2400	.68	1000
.047	2000	1.0	800
.068	2000	1.5	800
.100	1600	2.2	600

International Approvals (Pending)

Safety Agency	Standard
UL	UL-1414 (250VAC)
UL	UL-1283 (250VAC)
CSA	C22 2, No.8-M1986 (250VAC)
VDE	IEC384-14 II EN 132400
SEMKO	IEC384-14 II EN 132400
SEV	IEC384-14 II EN 132400
EI	IEC384-14 II EN 132400
DEMKO	IEC384-14 II EN 132400
NEMKO	IEC384-14 II EN 132400

Outline Dimensions



Catalog Number	Cap μF	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
157X103	.01	.492	.157	.374	.394	.024	12.5	4.0	9.5	10.0	.6
157X123	.012	.492	.157	.374	.394	.024	12.5	4.0	9.5	10.0	.6
157X153	.015	.492	.157	.374	.394	.024	12.5	4.0	9.5	10.0	.6
157X183	.018	.492	.157	.374	.394	.024	12.5	4.0	9.5	10.0	.6
157X223	.022	.492	.157	.374	.394	.024	12.5	4.0	9.5	10.0	.6
157X273	.027	.492	.197	.413	.394	.024	12.5	5.0	10.5	10.0	.6
157X333	.033	.492	.197	.413	.394	.024	12.5	5.0	10.5	10.0	.6
157X393	.039	.689	.157	.374	.591	.024	17.5	4.0	9.5	15.0	.6
157X473	.047	.689	.157	.374	.591	.024	17.5	4.0	9.5	15.0	.6
157X563	.056	.689	.157	.374	.591	.024	17.5	4.0	9.5	15.0	.6
157X683	.068	.689	.157	.374	.591	.024	17.5	4.0	9.5	15.0	.6
157X823	.082	.689	.197	.413	.591	.024	17.5	5.0	10.5	15.0	.6
157X104	.1	.689	.197	.413	.591	.024	17.5	5.0	10.5	15.0	.6
157X124	.12	.689	.295	.531	.591	.031	17.5	7.5	13.5	15.0	.8
157X154	.15	.689	.295	.531	.591	.031	17.5	7.5	13.5	15.0	.8
157X184	.18	.689	.354	.591	.591	.031	17.5	9.0	15.0	15.0	.8
157X224	.22	.689	.354	.591	.591	.031	17.5	9.0	15.0	15.0	.8
157X274	.27	1.024	.295	.650	.886	.031	26.0	7.5	16.5	22.5	.8
157X334	.33	1.024	.295	.650	.886	.031	26.0	7.5	16.5	22.5	.8
157X394	.39	1.024	.354	.650	.886	.031	26.0	9.0	16.5	22.5	.8
157X474	.47	1.024	.354	.709	.886	.031	26.0	9.0	18.0	22.5	.8
157X564	.56	1.220	.394	.768	1.083	.031	31.0	10.0	19.5	27.5	.8
157X684	.68	1.220	.394	.768	1.083	.031	31.0	10.0	19.5	27.5	.8
157X824	.82	1.220	.472	.846	1.083	.031	31.0	12.0	21.5	27.5	.8
157X105	1.0	1.220	.472	.846	1.083	.031	31.0	12.0	21.5	27.5	.8
157X125	1.2	1.220	.669	1.043	1.083	.031	31.0	17.0	26.5	27.5	.8
157X155	1.5	1.220	.669	1.043	1.083	.031	31.0	17.0	26.5	27.5	.8
157X185	1.8	1.220	.787	1.160	1.083	.031	31.0	20.0	29.5	27.5	.8
157X225	2.2	1.220	.787	1.160	1.083	.031	31.0	20.0	29.5	27.5	.8

NOTE: Parts are normally supplied with leads 30mm minimum
If short leads 3.5mm minimum are required, add 'S' to end of Catalog Number.
Please indicate if specific lead length is required.

158X Series — Type X2 Suppressor Capacitors
Metallized Polyester / Radial Leads

MALLORY

- Radial Leads in Two Lengths
- UL-1414 and CSA Approved
- Flame Retardant Case Meets UL94V-0
- Polyurethane End Fill Meets UL94V-0
- Used in applications where damage to the capacitor will not lead to the danger of electrical shock
- Lead Material Tinned Copper Clad Steel

For other X type capacitors see our UN Series Ceramic on page 153

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +100°C
Voltage Range:
275/250 VAC
(275VAC International Approvals pending)
Capacitance Range:
0.01 μF to 2.2 μF
Capacitance Tolerance:
±20% (Standard)
±10% (Special)
Dissipation Factor (DF)
tgδ 0.01 Max at 1,000 ± 100kHz

Insulation Resistance (IR)
(@ 500 VDC and 20°C)
Terminal to Terminal:
≤0.33μF 15,000 MΩ min
≥0.47μF 5,000 MΩ x μF min
Both Terminals to Body:
100,000 MΩ min

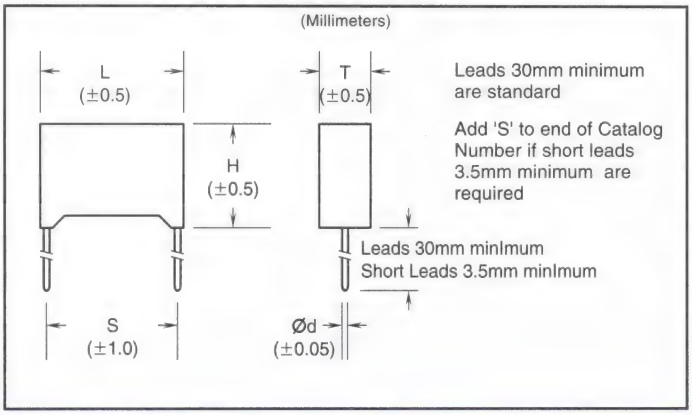
Maximum Pulse Rise Time

μF	V/μs	μF	V/μs
.01	2800	.22	1200
.022	2400	.47	1000
.033	2400	.68	1000
.047	2000	1.0	800
.068	2000	1.5	800
.100	1600	2.2	600

International Approvals

Safety Agency	Standard	File Number
UL	UL-1414 (250VAC)	E151554
UL	UL-1283 (250VAC)	E151553
CSA	C22 2, No.8-M1986 (250VAC)	LR37404-33M
VDE	IEC384-14 II EN 132400	18022-4670-1700
SEMKO	IEC384-14 II EN 132400	9308002
SEV	IEC384-14 II EN 132400	92.552158.01
EI	IEC384-14 II EN 132400	164090-01
DEMKO	IEC384-14 II EN 132400	112398EC/121
NEMKO	IEC384-14 II EN 132400	M70107

Outline Dimensions



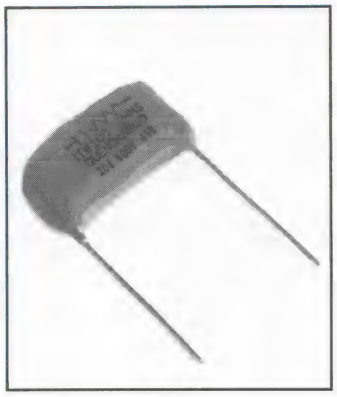
Catalog Number	Cap μF	Inches					Millimeters				
		L	T	H	S	Ød	L	T	H	S	Ød
158X103	.01	.669	.197	.472	.591	.024	17.0	5.0	12.0	15.0	.6
158X123	.012	.669	.197	.472	.591	.024	17.0	5.0	12.0	15.0	.6
158X153	.015	.669	.197	.472	.591	.024	17.0	5.0	12.0	15.0	.6
158X183	.018	.669	.197	.472	.591	.024	17.0	5.0	12.0	15.0	.6
158X223	.022	.669	.197	.472	.591	.024	17.0	5.0	12.0	15.0	.6
158X273	.027	.669	.197	.472	.591	.024	17.0	5.0	12.0	15.0	.6
158X333	.033	.669	.197	.472	.591	.024	17.0	5.0	12.0	15.0	.6
158X393	.039	.669	.217	.492	.591	.031	17.0	5.5	12.5	15.0	.8
158X473	.047	.669	.217	.492	.591	.031	17.0	5.5	12.5	15.0	.8
158X563	.056	.669	.256	.531	.591	.031	17.0	6.5	13.5	15.0	.8
158X683	.068	.669	.256	.531	.591	.031	17.0	6.5	13.5	15.0	.8
158X823	.082	.669	.256	.591	.591	.031	17.0	6.5	15.0	15.0	.8
158X104	.1	.669	.315	.591	.591	.031	17.0	8.0	15.0	15.0	.8
158X124	.12	.984	.256	.630	.886	.031	25.0	6.5	16.0	22.5	.8
158X154	.15	.984	.256	.630	.886	.031	25.0	6.5	16.0	22.5	.8
158X184	.18	.984	.315	.689	.886	.031	25.0	8.0	17.5	22.5	.8
158X224	.22	.984	.315	.689	.886	.031	25.0	8.0	17.5	22.5	.8
158X274	.27	1.181	.354	.669	1.083	.031	30.0	9.0	17.0	27.5	.8
158X334	.33	.984	.394	.768	.886	.031	25.0	10.0	19.5	22.5	.8
158X394	.39	1.181	.433	.866	1.083	.031	30.0	11.0	22.0	27.5	.8
158X474	.47	1.181	.433	.866	1.083	.031	30.0	11.0	22.0	27.5	.8
158X564	.56	1.181	.531	.965	1.083	.031	30.0	13.5	24.5	27.5	.8
158X684	.68	1.181	.531	.965	1.083	.031	30.0	13.5	24.5	27.5	.8
158X824	.82	1.201	.630	1.102	1.083	.039	30.5	16.0	28.0	27.5	1.0
158X105	1.0	1.201	.591	.965	1.083	.039	30.5	15.0	24.5	27.5	1.0
158X125	1.2	1.614	.610	1.102	1.476	.039	41.0	15.5	28.0	37.5	1.0
158X155	1.5	1.614	.610	1.102	1.476	.039	41.0	15.5	28.0	37.5	1.0
158X185	1.8	1.614	.689	1.280	1.476	.039	41.0	17.5	32.5	37.5	1.0
158X225	2.2	1.614	.689	1.280	1.476	.039	41.0	17.5	32.5	37.5	1.0

NOTE: If ±10% tolerance is required, add 'K' to end of Catalog Number

NOTE: Parts are normally supplied with leads 30mm minimum
If short leads 3.5mm minimum are required, add 'S' to end of Catalog Number.
Please indicate if specific lead length is required.

Q/QRL Series - (QUENCHARC®)
Metallized Polyester Arc Suppressor/Snubber Network

MALLORY



- Noise and Arc Suppression
- RC Snubber Network
- Relay Contact Protection
- Noise Reduction on Controllers/Drivers
- EMI/RFI Reduction
- Type QRL - UL/CSA Version

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +85°C at full rated voltage

Voltage Range:
200 VDC (125VAC) to 600 VDC (250VAC)

Capacitance Values:
0.1, 0.5, 1.0 μF

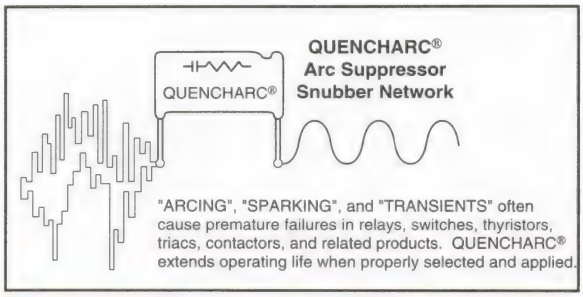
Resistor Values:
22, 47, 100, 150, 220 Ohms

Tolerance :
Capacitance - ±20%
Resistance - ±10%

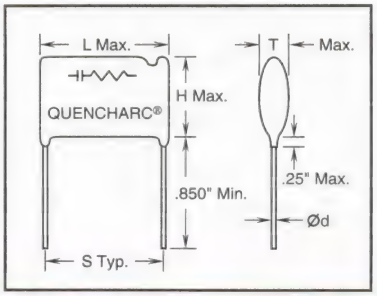
Construction:
Metallized polyester in series with a carbon composition resistor

Case:
Coated with a flame retardant epoxy

Dielectric Withstand Voltage:
Units shall withstand a DC potential of 1.6 times the DC voltage rating. Testing conducted at +25°C



Outline Dimensions



Test Method and Performance

DC Life Test

Units shall withstand a test potential of 125% of the rated voltage for a period of 500 hours at 85°C. A failure shall consist of :
— Capacitance change >5%
— DF greater than original limits

Long Term Stability

The capacitance shall not change more than 2% when stored at ambient temperature and humidity for a period of two years or less.

Catalog Number	Cap μF	Resistor		Inches					Millimeters				
		Watts	Ohms ±10%	L Max	T Max	H Max	S Typ	Ød	L Max	T Max	H Max	S Typ	Ød
200VDC/125VAC													
504M02QA100	.50	1/2	100	1.080	.370	.640	.820	.032	27.4	9.4	16.3	20.8	.8
504M02QA220	.50	1/2	220	1.080	.370	.640	.820	.032	27.4	9.4	16.3	20.8	.8
105M02QB47	1.00	1/2	47	1.450	.390	.660	1.200	.032	36.8	9.9	16.8	30.5	.8
600VDC/250VAC													
104M06QC22	.10	1/2	22	1.080	.390	.660	.820	.032	27.4	9.9	16.8	20.8	.8
104M06QC47	.10	1/2	47	1.080	.390	.660	.820	.032	27.4	9.9	16.8	20.8	.8
104M06QC100	.10	1/2	100	1.080	.390	.660	.820	.032	27.4	9.9	16.8	20.8	.8
104M06QC150	.10	1/2	150	1.080	.390	.660	.820	.032	27.4	9.9	16.8	20.8	.8

Note: **Other ratings are available by special request.**
Contact NACC for availability and price.

UL/CSA Recognized Across-the-Line Application

(Complies with UL1414/CSA-C22.2 No. 1)

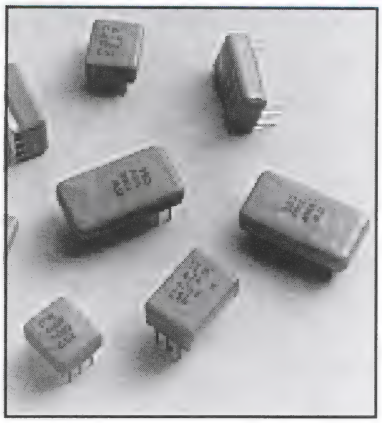
Catalog Number	Cap μF	Resistor		Inches					Millimeters				
		Watts	Ohms ±10%	L Max	T Max	H Max	S Typ	Ød	L Max	T Max	H Max	S Typ	Ød
125VAC													
104MACQRL150	.10	1/2	150	1.080	.440	.660	.820	.032	27.4	11.2	16.8	20.8	.8

Type QRL: UL File No. E33628
CSA File No. LR32208

CS Series - (Capstick®)
Metallized Polymer Network

NEW

MALLORY



- Ideal for High Frequency switching power supplies and DC to DC converters
- Low ESR/ESL
- High ripple current/high capacitance
- Made in USA
- SMT gull wing leads available
- Non-inductive design
- Standard anti-static tube packaging

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +85°C with no derating at 50/100 VDC
(at +125°C derate voltage by 50%)
-55°C to +125°C with no derating at 400 VDC

Voltage Range:
50, 100, 400 VDC

Capacitance Range:
.33μF to 20.0μF

Tolerance:
±10%

Construction:
Metallized polymer dielectric with multilayer construction

Lead Material:
Tinned Copper Alloy Frame

Case:
UL94V-0 epoxy

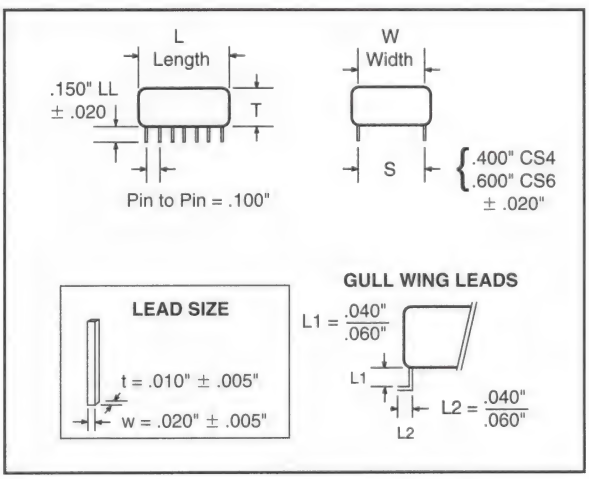
Dissipation Factor:
≤ 1.0% @ 1kHz

Insulation Resistance:
≥ 1000 Megaohm X μF need not to exceed 1000 Megaohms

Dielectric Strength:
1.3 x Rated Voltage: 50/100V
1.6 x Rated Voltage: 400V

Temperature Coefficient:
+6% from -55°C to +85°C

Self Inductance:
<6nH typical (CS6)
<4nH typical (CS4)



Test Method and Performance

Accelerated Dry Life	
Test Conditions	
Temperature	+85°C ± 5.0°C
Applied Voltage	1.25 X Rated Voltage
Test Duration	1000 hours Performance
Requirements	
Capacitance	Change of ≤ 5.0%
Dissipation Factor	≤1.0@1kHz
Insulation Resistance	≥ 1K Megaohms x μF, need not exceed 1K Megaohms

Humidity	
Test Conditions	
Temperature	+85°C ± 2.0°C
Applied Voltage	Zero Voltage
Humidity	85% ±2%RH
Test Duration	21 days
Performance Requirements	
Capacitance	Change of ≤ 7.0%
Dissipation Factor	≤1.0@1kHz
Insulation Resistance	≥ 30% of initial limit

Solderability	
Test Conditions	
Solder Temperature	+250°C ± 5.0°C
Test Duration	5 seconds ±1 seconds
Performance Requirements	
Capacitance	Change of ≤2.0%
Capacitance Drift	≤2.0% over 2 years between 0°C and 35°C and a RH of between 35% and 65%.
Vibration	Conforms to MIL-STD-202 Method 204D

Note: The 400V rating can handle 450V surge and is built to a 640V high potential.

					Inches				Millimeters					
Catalog Number	Cap μF	DC Voltage	ESR ohms @500kHz	RMS Current @500kHz	W Max	T Max	L Max	Nom. L.S.	W Max	T Max	L Max	Nom. L.S.	Leads Per side	Tube Quantity
106K050CS4*	10.0	50	.003	15.3	.500	.320	.620	.400	12.7	8.1	15.7	10.0	5	32
156K050CS4*	15.0	50	.0027	16.7	.500	.320	.880	.400	12.7	8.1	22.4	10.0	7	22
206K050CS4*	20.0	50	.0025	17.8	.500	.320	1.15	.400	12.7	8.1	29.2	10.0	9	16
405K100CS4*	4.0	100	.007	11.5	.500	.250	.450	.400	12.7	6.4	11.4	10.0	3	44
475K100CS4*	4.7	100	.006	12.2	.500	.250	.525	.400	12.7	6.4	13.3	10.0	3	38
685K100CS4*	6.8	100	.005	13.7	.500	.250	.700	.400	12.7	6.4	17.8	10.0	5	35
106K100CS4*	10.0	100	.003	15.3	.500	.250	.995	.400	12.7	6.4	25.3	10.0	7	20
334K400CS6*	.33	400	.012	6.0	.700	.320	.435	.600	17.8	8.1	11.0	15.0	3	44
474K400CS6*	.47	400	.011	6.2	.700	.320	.460	.600	17.8	8.1	11.7	15.0	3	42
105K400CS6*	1.0	400	.008	9.5	.700	.320	.880	.600	17.8	8.1	22.4	15.0	7	22

* Insert "G" if gull wing leads are required

ST Series - (Surfilm®) Metallized Polymer Surface Mount Capacitors

NEW

MALLORY

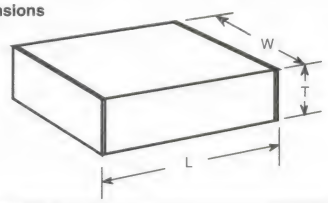
- EIA Chip Sizes
- Vapor Phase and IR solderable
- Made in USA
- Non-inductive design
- Tin-based solderable surface terminals
- Tape and Reel - Standard 13" reels

GENERAL SPECIFICATIONS

Operating Temperature:
-55°C to +125°C
Voltage Range:
50 VDC to 100 VDC
Capacitance Range:
.1μF to 2.2μF
Tolerance:
±10%
Construction:
Metallized polymer film, parallel plate
Electrodes:
Evaporated Aluminum
Case:
Self encased chip
Dissipation Factor:
≤ 0.8% @ 25°C 1kHz
Insulation Resistance:
≥ 1000 Megaohm X μF need not to exceed 1000 Megaohms
Dielectric Strength:
1.3 x Rated Voltage@ 2 sec
Pulse rating:
.1μF, 100V/μsec

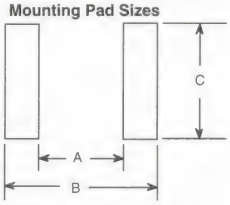
Catalog Number	Cap μF	DC Voltage	Case Size	Tape & Reel Qty	Inches T Max	mm T Max
104K050ST1812T	.1	50	1812	2000	.129	3.3
224K050ST1812T	.22	50	1812	2000	.153	3.9
474K050ST2824T	.47	50	2824	1800	.125	3.2
105K100ST2824T	1.0	100	2824	1500	.175	4.5
225K100ST3827T	2.2	100	3827	850	.217	5.5

Dimensions



Case Size	Inches (Millimeters)	
	W max	Length
1812	.134 (3.4)	.18 (4.5) -0, +.025 (0.6)
2824	.256 (6.5)	.28 (7.1) -0, +.025 (0.6)
3827	.286 (7.3)	.38 (9.7) -0, +.025 (0.6)

Mounting Pad Sizes



Case Size	Inches (Millimeters)		
	A	B	C
1812	.140 (3.6)	.335 (8.5)	.160 (4.1)
2824	.230 (5.8)	.430 (10.9)	.276 (7.0)
3827	.330 (8.4)	.530 (13.5)	.306 (7.8)

Tape and Reel: 13" per EIA Standard 481

μF	Case size	Reel Qty.	Tape Width
.1	1812	2000	12mm
.22	1812	2000	12mm
.47	2824	1800	16mm
1.0	2824	1500	16mm
2.2	3827	850	16mm

Test Method and Performance

Accelerated Dry Life	
Test Conditions	
Temperature	+85°C ± 5.0°C
Applied Voltage	1.25 X Rated Voltage
Test Duration	1000 hours
Performance Requirements	
Capacitance	Change of ≤ 5.0%
Dissipation Factor	≤.80%
Insulation Resistance	> 50% of specification

Humidity	
Test Conditions	
Temperature	+85°C ± 5.0°C
Applied Voltage	Zero Voltage
Humidity	85% ± 2%RH
Test Duration	21 days
Performance Requirements	
Capacitance	Change of ≤ 7.0%
Dissipation Factor	≤.80%
Insulation Resistance	≥ 30% of specifications

Solderability	
Test Conditions	
Solder Temperature	+220°C + 0°C, -10°C
Test Duration	30 seconds ±1 second
Performance Requirements	
Capacitance	Change of ≤ 5.0%

Soldering Guidelines

Recommended soldering methods
- Conductive Reflow
- Convection Reflow
- IR Reflow
- Vapor Phase Reflow
- Soldering Iron controlled to 220°C
- Wave Soldering is **not** recommended

Maximum solder reflow temperature
220°C for two minutes

Board attachment
Recommended for optimum soldering results parts should be spot glued to the substrate.

Board cleaning
Alcohol based solvents should **not** be used. They cause a temporary loss in the insulation resistance.

High Humidity Note:

In case of high humidity storage and short cycle reflow soldering, it is recommended that parts be pre-conditioned in an 85°C oven for a maximum of 12 hours prior to reflow soldering to minimize any effects caused by rapid vaporization of the moisture.

MALLORY

Porcelain Capacitors

Series		Type	Features	Capacitance Range	Voltage Range	Capacitance Tolerances	Operating Temperature	Temperature Coefficient of Capacitance	Terminations	Size
MPR	1	Unencapsulated Multilayer Porcelain	To 10 GHz High-Q	0.2 pF to 1,000 pF	50 WVDC to 500 WVDC	±0.1pF, ±0.25pF, ±0.5pF, ±1%, ±2%, ±5%, ±10%, ±20%	-55°C to +200°C (Derated)	+90±20 ppm/°C	Chip & Pellet, Gold Termination, Leaded on special order	1.4mm L x W 1.45mm max T & 2.79mm L x W 2.79mm max T
	3		To 10 GHz High-Q NPO					0±30 ppm/°C		
	5		To 20 GHz High-Q High Temperature	1 pF to 100 pF	100 WVDC to 500 WVDC		-55°C to +175°C Without Derating	+90±20 ppm/°C		
	7		To 10 GHz NPO	0.1 pF to 5,100 pF	50 WVDC to 500 WVDC		-55°C to +125°C Without Derating	0±30 ppm/°C		
	2		Wide Capacitance Range X7R	510 pF to 0.1 μF	50 WVDC to 500 WVDC	±20% Standard 10% & +80-20 by Special Request	-55°C to +85°C Without Derating	±15% Max		
	13		General Purpose Hi-Q	0.5 pF to 1,000 pF	50 WVDC to 500 WVDC	±0.25pF, ±0.5pF, ±5%, ±10%, ±20%, ±30%	-55°C to +200°C (Derated)	+90±30 ppm/°C		
MPV		Glass Encapsulated Multilayer Porcelain	Designed Primarily for RF Medium Power Applications	10 pF to 1000 pF	500 VDC to 1000 VDC / 500 VAC to 2000 VAC	±0.1pF, ±0.25pF, ±0.5pF, ±1%, ±2%, ±5%, ±10%	-55°C to +85°C Without Derating	+90±30 ppm/°C and 0±40 ppm/°C	Axial and Radial Leads	(L x W) 8.3mm x 5.1.mm to 23.5mm x 12.5mm (T) 3.2mm to 5.0mm

Multilayer Ceramic Capacitors

Series	Type	Features	Capacitance Range	Voltage Range	Capacitance Tolerances	Operating Temperature	Terminations	Size
MHQ	High Q Ceramic	To 1000 MHz Glass Encapsulated High-Q	0.5 pF to 3,000 pF	200 VDC and 300 VDC	±0.1pF, ±0.25pF, ±0.5pF, ±1%, ±2%, ±5%	-55°C to +125°C	Chip Axial Ribbons Radial Leads	2.75mm L x W - 1.55mm T to 10.79mm L x W - 2.29mm T
MHP	High Power Ceramic	To 100 MHz Glass Encapsulated Custom Product Available	10 pF to 3,000 pF	to 7K VDC to 5K Vrms	±.05pF, ±5%, ±10%	-55°C to +125°C	Wide Fine Silver Axial Ribbons	13.85mm x 13.85mm 26.95mm x 13.85mm 26.95mm x 20.95mm
MHPC	High Power Ceramic	To 100 MHz Glass Encapsulated Custom Product Available	10 pF to 3,000 pF	to 7K VDC to 5K Vrms	±.05pF, ±5%, ±10%	-55°C to +125°C	Wide Fine Silver Axial Ribbons	13.85mm x 13.85mm 26.95mm x 13.85mm 26.95mm x 20.95mm
MHK	High K Ceramic	Very High Capacitance per Unit Volume	.001 μF to 1.0 μF	25 WVDC to 50 WVDC	±10%, ±20%, +80%-20%	-55°C to +125°C	Axial or Radial Leads	3.55mm L x W - 1.50mm T to 10.40mm L x W - 2.00mm T

NEW

Trimmer Capacitors

Series	Type	Features	Capacitance Range	Voltage Range	Capacitance Tolerances	Operating Temperature	Terminations	Size
MAV	Air Trimmer	To 3 GHz Gold Plated Terminals	0.4 pF to 30 pF @ 1 MHz	250 WVDC and 500 WVDC	Not Applicable	-55°C to +125°C	Panel and PC board	See Specialized Catalog
MTR	Microwave Trimmer Sapphire Dielectric	To 13 GHz Gold Plated Terminals	0.3 pF to 8.0 pF	500 WVDC	Not Applicable	-65°C to +125°C	Panel and PC Board	See Specialized Catalog
MTD	Metallic microwave tuning devices consisting of a mounting bushing and a tuning rotor. These devices offer convenient means for the tuning of waveguides and microwave cavities.							

Available Microwave Kits

MAVKIT	
Catalog Number	Quantity
MAV01A30	3
MAV01D03	3
MAV02A06	3
MAV02D06	3
MAV03A10	3
MAV03D14	3
MAV04A20	2
MAV04D20	2

MTRKIT	
Catalog Number	Quantity
MTR121A	3
MTR521A	3
MTR222A	3
MTR922A	3
MTR124A	3
MTR128A	3

Ask for the comprehensive MICROELECTRONICS catalog for details on the vast assortment of microwave devices briefly described above

PSU Series
AC Motor Start Capacitors

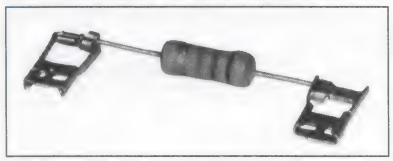
MALLORY

- For Motor Starting and other Intermittent Duty AC Applications
- Dual Quick Connect Terminals
- Rugged Bakelite Case
- Compact Size
- Easily Mounted
- Dual rated parts are tested and marked with highest voltage rating.

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +65°C
Storage Temperature:
-55°C to +85°C
Voltage Range:
110 to 330 VAC
Capacitance Range:
21μF to 1280μF
Operating Frequency:
50 to 60 Hz
Power Factor: 10% max
(12% ≤30μF)
Meets EIA RS-463 Type 2
(Normal Performance)

ACR15KT Motor Start Resistor



15K Ohm 2 watt bleeder resistor for AC motor start applications. Saves relay switch contacts and capacitor, particularly in capacitor start-run applications.
1/4" quick connect terminals eliminate need for soldering.

Cap μF	VAC	Case Code	Diameter (Inches) ±.015	Length (Inches) ±.06	Catalog Number
21-25	110/125	1	1 7/16	2 3/4	PSU2115
25-30	110/125	1	1 7/16	2 3/4	PSU2515
30-36	110/125	1	1 7/16	2 3/4	PSU3015
36-43	110/125	1	1 7/16	2 3/4	PSU3615
43-52	110/125	1	1 7/16	2 3/4	PSU4315
47-56	110/125	1	1 7/16	2 3/4	PSU4715
53-64	110/125	1	1 7/16	2 3/4	PSU5315
64-77	110/125	1	1 7/16	2 3/4	PSU6415
72-86	110/125	1	1 7/16	2 3/4	PSU7215
88-106	110/125	1	1 7/16	2 3/4	PSU8815
108-130	110/125	1	1 7/16	2 3/4	PSU10815
124-149	110/125	1	1 7/16	2 3/4	PSU12415
130-156	110/125	1	1 7/16	2 3/4	PSU13015
145-174	110/125	1	1 7/16	2 3/4	PSU14515
161-193	110/125	1	1 7/16	2 3/4	PSU16115
189-227	110/125	1	1 7/16	2 3/4	PSU18915A
200-240	110/125	2	1 7/16	3 3/8	PSU20015
216-259	110/125	2	1 7/16	3 3/8	PSU21615
» 216-259	110/125	1	1 7/16	2 3/4	PSU21615A
233-280	110/125	2	1 7/16	3 3/8	PSU23315A
» 233-280	110/125	1	1 7/16	2 3/4	PSU23315B
243-292	110/125	2	1 7/16	3 3/8	PSU24315A
» 243-292	110/125	1	1 7/16	2 3/4	PSU24315B
270-324	110/125	2	1 7/16	3 3/8	PSU27015A
» 270-324	110/125	1	1 7/16	2 3/4	PSU27015B
300-360	110/125	4	1 13/16	3 3/8	PSU30015
324-389	110/125	3	1 7/16	4 3/8	PSU32415A
» 324-389	110/125	1	1 7/16	2 3/4	PSU32415B
340-408	110/125	4	1 13/16	3 3/8	PSU34015
» 340-408	110/125	2	1 7/16	3 3/8	PSU34015A
378-454	110/125	4	1 13/16	3 3/8	PSU37815
» 378-454	110/125	2	1 7/16	3 3/8	PSU37815A
400-480	110/125	4	1 13/16	3 3/8	PSU40015
» 400-480	110/125	2	1 7/16	3 3/8	PSU40015A
430-516	110/125	4	1 13/16	3 3/8	PSU43015A
» 430-516	110/125	2	1 7/16	3 3/8	PSU43015B
460-552	110/125	4	1 13/16	3 3/8	PSU46015A
» 460-552	110/125	2	1 7/16	3 3/8	PSU46015B
540-648	110/125	4	1 13/16	3 3/8	PSU54015A
» 540-648	110/125	5	1 13/16	4 3/8	PSU54015B
590-708	110/125	5	1 13/16	4 3/8	PSU59015A
» 590-708	110/125	4	1 13/16	3 3/8	PSU59015B
645-774	110/125	5	1 13/16	4 3/8	PSU64515
» 645-774	110/125	4	1 13/16	3 3/8	PSU64515A
708-850	110/125	5	1 13/16	4 3/8	PSU70815
» 708-850	110/125	4	1 13/16	3 3/8	PSU70815A
720-864	110/125	5	1 13/16	4 3/8	PSU72015
» 720-864	110/125	4	1 13/16	3 3/8	PSU72015A
800-960	110/125	5	1 13/16	4 3/8	PSU80015
» 800-960	110/125	4	1 13/16	3 3/8	PSU80015A
815-978	110/125	5	1 13/16	4 3/8	PSU81515
» 815-978	110/125	4	1 13/16	3 3/8	PSU81515A
829-995	110/125	5	1 13/16	4 3/8	PSU82915A
» 829-995	110/125	4	1 13/16	3 3/8	PSU82915B
850-1020	110/125	5	1 13/16	4 3/8	PSU85015
» 850-1020	110/125	4	1 13/16	3 3/8	PSU85015A
1000-1200	110/125	7	2 1/16	4 3/8	PSU100015A
1020-1224	110/125	7	2 1/16	4 3/8	PSU102015
1175-1410	110/125	7	2 1/16	4 3/8	PSU117515
1280-1536	110/125	7	2 1/16	4 3/8	PSU128015
21-25	165	1	1 7/16	2 3/4	PSU2165A
25-30	165	1	1 7/16	2 3/4	PSU2565A
30-36	165	1	1 7/16	2 3/4	PSU3065A
36-43	165	1	1 7/16	2 3/4	PSU3665A
43-52	165	1	1 7/16	2 3/4	PSU4365A
47-56	165	1	1 7/16	2 3/4	PSU4765A
53-64	165	1	1 7/16	2 3/4	PSU5365A
64-77	165	1	1 7/16	2 3/4	PSU6465A
72-86	165	1	1 7/16	2 3/4	PSU7265A
88-106	165	2	1 7/16	3 3/8	PSU8865
» 88-106	165	1	1 7/16	2 3/4	PSU8865A
108-130	165	2	1 7/16	3 3/8	PSU10865
» 108-130	165	1	1 7/16	2 3/4	PSU10865A
124-149	165	2	1 7/16	3 3/8	PSU12465
» 124-149	165	1	1 7/16	2 3/4	PSU12465A
130-156	165	2	1 7/16	3 3/8	PSU13065
» 130-156	165	1	1 7/16	2 3/4	PSU13065A
145-174	165	2	1 7/16	3 3/8	PSU14565
» 145-174	165	1	1 7/16	2 3/4	PSU14565A
161-193	165	2	1 7/16	3 3/8	PSU16165
» 161-193	165	1	1 7/16	2 3/4	PSU16165A
189-227	165	2	1 7/16	3 3/8	PSU18965B
» 189-227	165	1	1 7/16	2 3/4	PSU18965C
216-259	165	4	1 13/16	3 3/8	PSU21665A
233-280	165	3	1 7/16	4 3/8	PSU23365
» 233-280	165	4	1 13/16	3 3/8	PSU23365A
243-292	165	3	1 7/16	4 3/8	PSU24365
» 243-292	165	4	1 13/16	3 3/8	PSU24365A
270-324	165	3	1 7/16	4 3/8	PSU27065A
» 270-324	165	4	1 13/16	3 3/8	PSU27065B
324-389	165	5	1 13/16	4 3/8	PSU32465
» 324-389	165	4	1 13/16	3 3/8	PSU32465A
340-408	165	5	1 13/16	4 3/8	PSU34065
» 340-408	165	4	1 13/16	3 3/8	PSU34065A
378-454	165	5	1 13/16	4 3/8	PSU37865
» 378-454	165	4	1 13/16	3 3/8	PSU37865A
400-480	165	5	1 13/16	4 3/8	PSU40065
» 400-480	165	4	1 13/16	3 3/8	PSU40065A
430-516	165	5	1 13/16	4 3/8	PSU43065
» 430-516	165	4	1 13/16	3 3/8	PSU43065A
460-552	165	5	1 13/16	4 3/8	PSU46065
» 460-552	165	4	1 13/16	3 3/8	PSU46065A
540-648	165	7	2 1/16	4 3/8	PSU54065
» 540-648	165	4	1 13/16	3 3/8	PSU54065A
21-25	220/250	1	1 7/16	2 3/4	PSU2135
25-30	220/250	1	1 7/16	2 3/4	PSU2535
30-36	220/250	1	1 7/16	2 3/4	PSU3035
36-43	220/250	1	1 7/16	2 3/4	PSU3635
43-52	220/250	2	1 7/16	3 3/8	PSU4335B
» 43-52	220/250	1	1 7/16	2 3/4	PSU4335C

» **Denotes a NEW Product**

See pages 258 & 259 for Capacitor Hardware Plus Additional Resistor Choices.

PSU Series
AC Motor Start Capacitors

MALLORY

Cap µF	VAC	Case Code	Diameter (Inches) ±.015	Length (Inches) ±.06	Catalog Number
47-56	220/250	2	1 7/16	3 3/8	PSU4735
» 47-56	220/250	1	1 7/16	2 3/4	PSU4735A
53-64	220/250	2	1 7/16	3 3/8	PSU5335
» 53-64	220/250	1	1 7/16	2 3/4	PSU5335A
64-77	220/250	2	1 7/16	3 3/8	PSU6435
» 64-77	220/250	1	1 7/16	2 3/4	PSU6435A
72-86	220/250	4	1 13/16	3 3/8	PSU7235
88-106	220/250	4	1 13/16	3 3/8	PSU8835
108-130	220/250	4	1 13/16	3 3/8	PSU10835A
124-149	220/250	5	1 13/16	4 3/8	PSU12435
» 124-149	220/250	4	1 13/16	3 3/8	PSU12435A
130-156	220/250	5	1 13/16	4 3/8	PSU13035
» 130-156	220/250	4	1 13/16	3 3/8	PSU13035A
145-174	220/250	5	1 13/16	4 3/8	PSU14535
» 145-174	220/250	4	1 13/16	3 3/8	PSU14535A
161-193	220/250	7	2 1/16	4 3/8	PSU16135A
189-227	220/250	7	2 1/16	4 3/8	PSU18935A
» 189-227	220/250	6	2 1/16	3 3/8	PSU18935B
216-259	220/250	7	2 1/16	4 3/8	PSU21635A
» 216-259	220/250	6	2 1/16	3 3/8	PSU21635B
233-280	220/250	7	2 1/16	4 3/8	PSU23335A
» 233-280	220/250	6	2 1/16	3 3/8	PSU23335B
243-292	220/250	7	2 1/16	4 3/8	PSU24335
» 243-292	220/250	6	2 1/16	3 3/8	PSU24335A
270-324	220/250	7	2 1/16	4 3/8	PSU27035A
» 270-324	220/250	6	2 1/16	3 3/8	PSU27035B
» 16-20	330	2	1 7/16	3 3/8	PSU1630
» 18-22	330	4	1 13/16	3 3/8	PSU1830

Cap µF	VAC	Case Code	Diameter (Inches) ±.015	Length (Inches) ±.06	Catalog Number
21-25	330	1	1 7/16	2 3/4	PSU2130
» 21-25	330	2	1 7/16	3 3/8	PSU2130A
25-30	330	2	1 7/16	3 3/8	PSU2530
30-36	330	2	1 7/16	3 3/8	PSU3030
36-43	330	2	1 7/16	3 3/8	PSU3630
43-52	330	2	1 7/16	3 3/8	PSU4330
» 43-52	330	4	1 13/16	3 3/8	PSU4330A
47-56	330	4	1 13/16	3 3/8	PSU4730
53-64	330	4	1 13/16	3 3/8	PSU5330B
64-77	330	4	1 13/16	3 3/8	PSU6430
72-86	330	5	1 13/16	4 3/8	PSU7230B
» 72-86	330	4	1 13/16	3 3/8	PSU7230C
88-106	330	5	1 13/16	4 3/8	PSU8830A
» 88-106	330	4	1 13/16	3 3/8	PSU8830B
108-130	330	7	2 1/16	4 3/8	PSU10830B
124-149	330	8	2 9/16	4 3/8	PSU12430
» 124-149	330	7	2 1/16	4 3/8	PSU12430A
130-156	330	7	2 1/16	4 3/8	PSU13030
145-174	330	7	2 1/16	4 3/8	PSU14530A
161-193	330	8	2 9/16	4 3/8	PSU16130
» 161-193	330	7	2 1/16	4 3/8	PSU16130A
189-227	330	8	2 9/16	4 3/8	PSU18930
» 189-227	330	7	2 1/16	4 3/8	PSU18930A
216-259	330	8	2 9/16	4 3/8	PSU21630
» 216-259	330	7	2 1/16	4 3/8	PSU21630A
270-324	330	8	2 9/16	4 3/8	PSU27030
» 270-324	330	7	2 1/16	4 3/8	PSU27030A
378-454	330	8	2 9/16	4 3/8	PSU37830
460-552	330	8	2 9/16	4 3/8	PSU46030

» **Denotes a NEW Product**

See page 258 & 259 for Capacitor Hardware Plus Additional Resistor Choices.

Type MPF
AC Metallized Polypropylene Motor Run Capacitors

- Internal Protector
- Environmentally Safe
- Light Weight
- Small Size
- Long Life and High Reliability
- Double Rolled Seams
- Applications:
  - Lighting
  - Motors
  - Power Factor Correction
  - Phase Shifting
  - Air Conditioning
  - Refrigeration

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +70°C (Case)
Voltage Range:
330, 370 and 440 VAC
Capacitance Range:
1μF to 80μF
Capacitance Tolerance:
±10%
Operating Frequency:
50 to 60 Hz
Dissipation Factor:
0.1% max @ 60 Hz
UL Recognized: Yellow Card
Number E65270
CSA Certified
Meets EIA RS-456 Char. E

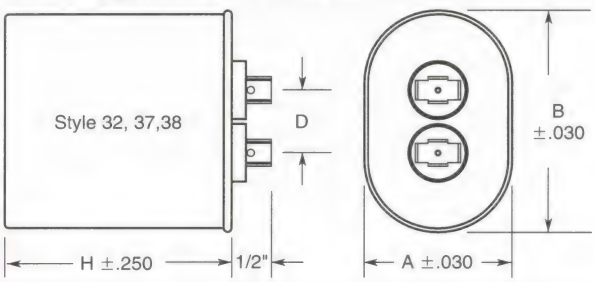
Round and Flat Oval Cans

Metallized polypropylene film dielectric capacitors offer a new option for alternating current applications. All devices have metal cases and 4-prong* quick disconnect terminals. These capacitors pack the same capacitance and voltage capabilities of a conventional paper capacitor into a smaller case of considerably lighter weight. In addition, these parts have extremely low dissipation factors. They offer high reliability and long life and meet EIA Standard RS-456 Characteristic 'E'. Allow 1/2 inch clearance above the terminals on fluid-filled capacitors for interrupter operation.

OUTLINE DIMENSIONS (MPF and MSF) (Inches)

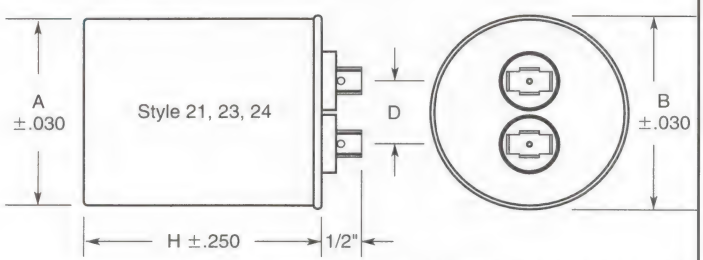
Flat Oval Containers					
Style	A	B	H	D	Industry Type
32	1-5/16	2-5/32	*	13/16	1-1/4 F.O.
37	1-29/32	2-29/32	*	13/16	1-3/4 F.O.
38	1-31/32	3-21/32	*	13/16	2 F.O.

* See Rating Tables for 'H' Dimension



Round Containers					
Style	A	B	H	D	Industry Type
21	1-3/4	1-7/8	*	13/16	1-3/4" Round
23	2	2-1/8	*	13/16	2" Round
24	2-1/2	2-5/8	*	13/16	2-1/2" Round

* See Rating Tables for 'H' Dimension



* 21 Style round units are 3-prong.

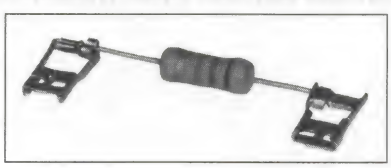
FLAT OVAL (SINGLE) STYLE

Cap μF	VAC	Base Style	Height (Inches)	Catalog Number
1	370	32	2.13	32FD3701
2	370	32	2.13	32FD3702
3	370	32	2.13	32FD3703
4	370	32	2.13	32FD3704
5	370	32	2.38	32FD3705
6	370	32	2.38	32FD3706
7.5	370	32	2.38	32FD37075
10	370	32	2.63	32FD3710
12.5	370	32	3.00	32FD37125
12.5	370	37	2.63	37FD37125
15	370	37	2.63	37FD3715
17.5	370	37	2.63	37FD37175
20	370	37	2.63	37FD3720
22.5	370	37	2.63	37FD37225
25	370	37	2.63	37FD3725
27.5	370	38	3.00	38FD37275
30	370	37	3.00	37FD3730
30	370	38	3.00	38FD3730
35	370	37	3.75	37FD3735
35	370	38	3.00	38FD3735
40	370	37	3.75	37FD3740
40	370	38	3.00	38FD3740
45	370	37	3.75	37FD3745
45	370	38	3.00	38FD3745
50	370	38	3.00	38FD3750
70	370	38	3.75	38FD3770
1	440	32	2.13	32FB4401
2	440	32	2.13	32FB4402
3	440	32	2.38	32FB4403
4	440	32	2.38	32FB4404
5	440	32	2.63	32FB4405
6	440	32	2.63	32FB4406
7.5	440	32	2.63	32FB44075
7.5	440	37	2.63	37FB44075
10	440	32	3.75	32FB4410
10	440	37	2.63	37FB4410
12.5	440	37	2.63	37FB44125
15	440	37	2.63	37FB4415
17.5	440	37	2.63	37FB44175
20	440	37	3.00	37FB4420
20	440	38	3.00	38FB4420
25	440	37	3.75	37FB4425
25	440	38	3.75	38FB4425
30	440	38	3.75	38FB4430
35	440	37	4.75	37FB4435
35	440	38	3.75	38FB4435
40	440	37	4.75	37FB4440
40	440	38	3.75	38FB4440
45	440	38	3.75	38FB4445
50	440	38	3.75	38FB4450
55	440	38	4.75	38FB4455
60	440	38	4.75	38FB4460

Denotes a NEW Product

See pages 258 & 259 for capacitor hardware plus additional resistor choices.

ACR220KT Motor Run Resistor Kit



220K Ohm 1 watt bleeder resistor for AC motor run applications. Saves relay switch contacts and capacitor, particularly in capacitor start-run applications. 1/4" quick connect terminals eliminate need for soldering.

Type MPF
AC Metallized Polypropylene Motor Run Capacitors

MALLORY

FLAT OVAL (DUAL) STYLE

Cap µF	VAC	Base Style	Height (Inches)	Catalog Number
15+4	370	37	2.63	37FD371504
15+5	370	37	2.63	37FD371505
15+10	370	37	2.63	37FD371510
20+5	370	37	2.63	37FD372005
20+15	370	38	2.63	38FD372015
25+5	370	38	2.63	38FD372505
30+5	370	38	3.00	38FD373005
35+3	370	38	3.00	38FD373503
35+4	370	38	3.00	38FD373504
35+5	370	38	3.00	38FD373505
40+5	370	38	3.75	38FD374005
40+7.5	370	38	3.75	38FD3740075
45+5	370	38	3.75	38FD374505
45+7.5	370	38	3.75	38FD3745075
45+10	370	38	3.75	38FD374510
25+5	440	37	3.00	37FB442505
30+5	440	38	3.75	38FB443005
35+5	440	38	3.75	38FB443505

See pages 258 & 259 for Capacitor Hardware

ROUND STYLE

Cap µF	VAC	Base Style	Height (Inches)	Catalog Number
3	330	23	2.63	23FD3303
4	330	23	2.63	23FD3304
5	330	23	2.63	23FD3305
6	330	23	2.63	23FD3306
7	330	23	2.63	23FD3307
8	330	23	2.63	23FD3308
10	330	23	2.63	23FD3310
3	370	21	2.63	21FD3703
4	370	21	2.63	21FD3704
5	370	21	2.63	21FD3705
6	370	21	2.63	21FD3706
7	370	21	2.63	21FD3707
8	370	21	2.63	21FD3708
10	370	21	2.63	21FD3710
12.5	370	21	2.63	21FD37125
15.0	370	21	2.63	21FD3715
17.5	370	21	2.63	21FD37175
20	370	21	2.63	21FD3720
25	370	21	3.00	21FD3725
25	370	23	3.00	23FD3725
30	370	21	3.00	21FD3730
30	370	23	3.00	23FD3730
35	370	21	3.75	21FD3735
35	370	23	3.00	23FD3735
40	370	21	3.75	21FD3740
40	370	23	3.00	23FD3740
45	370	23	3.75	23FD3745
45	370	24	3.00	24FD3745
50	370	23	3.75	23FD3750
50	370	24	3.00	24FD3750
55	370	23	3.75	23FD3755
55	370	24	3.00	24FD3755
60	370	23	3.75	23FD3760
60	370	24	3.00	24FD3760
65	370	24	3.75	24FD3765
70	370	24	3.75	24FD3770
80	370	24	4.75	24FD3780
15	440	21	2.63	21FB4415
20	440	21	3.00	21FB4420
20	440	23	3.00	23FB4420
22.5	440	21	3.00	21FB44225
22.5	440	23	3.00	23FB44225
25	440	21	3.75	21FB4425
25	440	23	3.0	23FB4425
30	440	23	3.75	23FB4430
30	440	24	3.00	24FB4430
35	440	23	3.75	23FB4435
35	440	24	3.00	24FB4435
40	440	23	3.75	23FB4440
40	440	24	3.75	24FB4440
45	440	24	3.75	24FB4445
50	440	24	3.75	24FB4450
55	440	24	3.75	24FB4455
60	440	24	4.75	24FB4460
70	440	24	4.75	24FB4470

Denotes a NEW Product

See pages 258& 259 for capacitor hardware plus additional resistor choices.

Type MSF
AC Power Supply Capacitors

MALLORY

- Internal Protector
- Environmentally Safe
- Low Dissipation Factor
- Small Size
- Long Life and High Reliability
- Self Healing
- Applications:
  - Lighting
  - Power Supplies
  - Motor Run
  - Power Factor Correction
  - Phase Conversion

GENERAL SPECIFICATIONS

Operating Temperature:
-40°C to +70°C (Case)
Voltage :
660 VAC
Capacitance Range:
1µF to 30µF
Capacitance Tolerance:
±6%
Operating Frequency:
50 to 60 Hz
Dissipation Factor:
0.1% max @ 60 Hz
AC Leakage:
≤20µA

*CSA Certified
UL Recognized: Yellow Card
Number E65270

Meets EIA RS-495 Characteristics X & Y

Flat oval 1-1/4", 1-3/4", 2" industry types

Metallized Paper-Polypropylene

Metallized paper-polypropylene capacitors are suitable for use in ferroresonant power supplies as well as other AC continuous duty applications. They are supplied in the same rigid metal cases as the AC Motor Run series, have biodegradable oil, and are UL recognized:

Cap µF	VAC	Base Style	Height (Inches)	Catalog Number
1	660	32	2.0	32KB6601
2	660	32	2.0	32KC6602
3	660	32	2.0	32KE6603
3	660	37	2.0	37KE6603
4	660	32	2.25	32KE6604
4	660	37	2.0	37KE6604
5	660	32	2.5	32KE6605
5	660	37	2.25	37KE6605
6	660	32	2.75	32KE6606
6	660	37	2.75	37KE6606
7	660	32	3.0	32KD6607
7.5	660	37	2.75	37KD66075
8	660	32	3.5	32KD6608
8	660	37	2.75	37KD6608
10	660	37	3.0	37KD6610
12	660	37	3.0	37KD6612
15	660	37	3.38	37KD6615
18	660	37	3.88	37KD6618
20	660	38	3.38	38KC6620
25	660	38	4.13	38KC6625
30	660	38	4.25	38KD6630

See pages 258 & 259 for capacitor hardware plus additional resistor choices.

Index
Sonalert® Audible Signal Devices

MALLORY

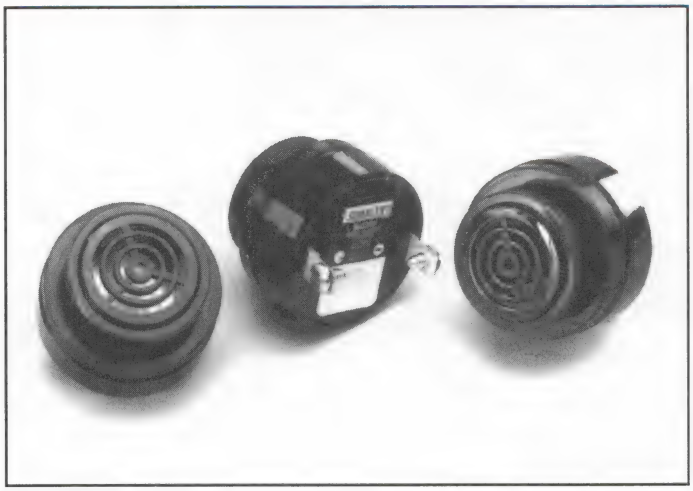
Index
Audible Signal Devices

NEW

MALLORY

Series	Mounting	Frequency kHz ±.5	Voltage Range (VDC)	Loudness (dB)	Current (mA)	Tone	Page
Piezoelectric Transducers							
PT	Printed Circuit & Flange	Various	1.5 - 30	80 - 100	Requires Drive Circuitry	Continuous	**236**
Electro-Magnetic Transducers							
PB	Pins	Various	1.5 - 12	80 - 85	Requires Drive	Continuous Circuitry	**237**
Piezoelectric Telephone Ringers							
PT	Pins & Flange	Various	25 - 40	80 - 87	Requires Drive	Continuous Circuitry	**237**
Miniature Speaker (Cone Type)							
PB	Printed Circuit & Flange	1250 & 1500	0 .15 - 0.2 Watts	75 - 85	Requires Drive	Continuous Circuitry	**236**
Piezo Indicators							
PK	Printed Circuit, Pins & Flange	Various	1.5 - 30	80 - 95	8 - 20	Constant	**239**
PF	Printed Circuit, Pins & Flange	Various	1.5 - 30	80 - 95	8 - 18	Fast Pulse	**239**
PL	Printed Circuit, Pins & Flange	Various	1.5 - 30	80 - 95	8 - 18	Slow Pulse	**240**
PFD	Printed Circuit, Pins & Flange	Various	3 - 28	80 - 95	8 - 18	Constant Fast Pulse	**239**
PLD	Printed Circuit, Pins & Flange	Various	3 - 28	80 - 95	8 - 18	Constant SlowPulse	**239**
Electro-Magnetic Indicators							
PB	Pins	2300 Hz	1.25 - 14	80 - 85	20 - 30	Constant	**240**
PK	Flange	400 Hz	2.0 - 28	82 - 85	17 - 20	Constant	**240**
Piezoelectric Sirens							
PS	Bracket, Pins & Flange	1.5 - 3	6 - 16	100 - 115	40 - 400	Continuous	**241**

Sonalert® Audible Signal Devices



The Mallory Sonalert® produces an audible tone by internally creating an oscillating signal which drives a piezo ceramic transducer mounted in a sound chamber. Various types of continuous and intermittent tones are available from the Mallory Sonalert® product line.

Self driven piezo ceramic transducers are superior to electromagnetic buzzers because they produce no arcing, electrical noise, or mechanical wear during operation. They are more reliable and operate more consistently during their operating life and are able to produce many more types of tones compared to buzzers.

The Mallory Sonalert® can be actuated by AC and DC power signals and has several mounting configurations and terminations available.

Criteria for Selecting Mallory Sonalert® Products

There are a multitude of Sonalert models listed in this catalog. The following factors should be considered before selecting a Sonalert from the list of models available:

1. **Continuous or Intermittent tone?**
   Intermittent tones are more discernable than continuous tones.

2. **Magnitude of sound required?**
   Loud, medium, and soft sounds are available for many versions.

3. **What type of actuation signal is available?**
   Sonalerts are available which operate with various AC and DC voltages from 1V to 250V.

4. **What type of mounting configuration and termination is required?**
   Many types are available and outlined on the next few pages.

5. **Can't find exactly what you require?**
   Contact the Sonalert Product Marketing Manager to see if a custom design can be produced for your application. Special continuous and intermittent tones can be created for your unique application. Special mounting configurations and terminations can also be developed.

Because the operation of the Sonalert audible signal device is dependent upon the circuit in which it is used, it is advisable to thoroughly test the selected device in the specific circuit and application to assure mechanical and electrical compatibility and verify system performance.

Underwriters Laboratories

The following models are listed as recognized components - Audible Signal Appliances

SBM2	SC110K	SC628	SC628P
SBM428	SC110N	SC628A	SC628-9B
SC110	SC110P	SC628D	SC648
SC110D	SC110Q	SC628H	SC648AD
SC110H	SC416	SC628J	SNP428
SC110J			

Guide Number UCST2, Yellow Card Number S1290.

Mallory Sonalerts are covered by one or more of the following U.S. Patent Numbers: **3,815,219 - 3,879,726 - 3,922,672 - 4,104,628 4,213,121 - 4,225,856 - 4,626,799**

Commercial and Industrial
Sonalert® Audible Signal Devices

MALLORY

Catalog Number	Loudness Category	Mounting Method	Case Style	Frequency ± 500 Hz	Minimum Sound Pressure dB (A) at Two Feet		Operating Voltage ✻ AC/DC Non-Polar All Others DC Only		Typical Operating Current (mA)	
					At Min V	At Max V	■ Min	Max	At Min V	At Max V
» Denotes a NEW Product				**Continuous Tones**						
• SC110N	Loud	Panel	D	2900	80	95	✻ 30	120	6	24
SC307N	Loud	Panel	C	2900	80	90	3	7	3	8
SC616N	Loud	Panel	C	2900	80	95	6	16	4	16
SC616NL	Loud	Panel	C-3	2900	80	95	6	16	4	16
SC628N	Loud	Panel	C	2900	80	90	6	28	3	14
» SC616N-3	Loud	Printed Board	G	2900	80	95	6	16	4	16
SC628NL	Loud	Panel	C-3	2900	80	90	6	28	3	14
SC628AN	Loud	Panel	D	2900	80	95	✻ 6	28	8	28
SC648AN	Loud	Panel	D	2900	80	95	✻ 10	48	8	28
» SC648ND	Loud	Panel	D	1900	80	90	10	48	10	30
• SBM2	Medium	Printed Board	F	2900	55	68	1	5	3	16
• SBM428	Medium	Printed Board	F	2900	64	78	4	28	3	16
SNP2	Medium	Snap In Panel	B	2900	55	68	1	5	2	12
• SNP428	Medium	Snap In Panel	B	2900	64	76	4	28	3	18
SC105	Medium	Panel	C	2900	60	75	1	5	3	16
• SC110	Medium	Panel	D	2900	68	80	✻ 30	120	6	21
• SC110D	Medium	Panel	D	1900	60	75	✻ 30	120	6	21
• SC110H	Medium	Panel	D	4500	68	80	✻ 30	120	6	21
SC250	Medium	Panel	D	2900	68	80	✻ 60	250	4	16
SC250D	Medium	Panel	D	1900	60	72	✻ 60	250	4	16
SC250H	Medium	Panel	D	4500	68	80	✻ 60	250	4	16
• SC416	Medium	Panel	C	2900	68	80	4	16	4	14
• SC628	Medium	Panel	C	2900	68	80	6	28	3	18
• SC628A	Medium	Panel	D	2900	68	80	✻ 6	28	6	23
SC628AD	Medium	Panel	D	1900	60	75	✻ 6	28	4	16
SC628AH	Medium	Panel	D	4500	68	80	✻ 6	28	4	16
• SC628D	Medium	Panel	C	1900	60	75	6	28	6	23
• SC628H	Medium	Panel	C	4500	68	80	6	28	6	23
SC628L	Medium	Panel	C-3	2900	68	80	6	28	3	14
▲ST628	Medium	Panel	C	2900	60	80	6	28	1.5	12
• SC648	Medium	Panel	C	2900	68	80	10	48	5	22
SC648A	Medium	Panel	D	2900	68	80	✻ 10	48	4	16
• SC648AD	Medium	Panel	D	1900	60	75	✻ 10	48	4	16
SC648AH	Medium	Panel	D	4500	68	80	✻ 10	48	4	16
SC648D	Medium	Panel	C	1900	60	75	10	48	3	17
SC648H	Medium	Panel	C	4500	68	80	10	48	3	14
SC1.5	Soft	Twist Tab	A	3500	60@1.5V		1	4	4@ 1.5V	
SC6	Soft	Twist Tab	A	3500	68@ 6V		4	8	12@ 6V	
SC12	Soft	Twist Tab	A	3500	70@ 12V		8	15	14@ 12V	
SC18	Soft	Twist Tab	A	3500	70@ 18V		14	20	16@ 18V	
SC24	Soft	Twist Tab	A	3500	70@ 24V		20	30	16@ 24V	
SNP428F	Soft	Snap In Panel	B	2900	52	68	4	28	0.5	3
SC110E	Soft	Panel	D	1900	55	65	✻ 30	120	3	14
SC110F	Soft	Panel	D	2900	55	65	✻ 30	120	1	4
SC250E	Soft	Panel	D	1900	55	65	✻ 60	250	3	14
SC250F	Soft	Panel	D	2900	55	65	✻ 60	250	1	4
SC628AE	Soft	Panel	D	1900	50	65	✻ 6	28	3	14
SC628AF	Soft	Panel	D	2900	50	65	✻ 6	28	1	4
SC628E	Soft	Panel	C	1900	55	68	6	28	3	8
SC628F	Soft	Panel	C	2900	55	70	6	28	0.5	3
SC648AE	Soft	Panel	D	1900	55	65	✻ 10	48	3	14

▲ Denotes High Trigger Model (Start Up Voltage Approximately 3 V).
• Denotes UL Models

✻ For both DC or AC Operation
(AC Voltage is RMS for 50 or 60 Hz Power Line)

■ Minimum voltage specified for sound test does not represent sound turn-on or turn-off points. Units will sound at lower voltages.

Commercial and Industrial
Sonalert® Audible Signal Devices

MALLORY

» Denotes a NEW Product

Short Pulse

Turns on and off at .5 to 2 pulses per second depending upon voltage at 10% duty cycle.

Catalog Number	Loudness Category	Mounting Method	Case Style	Frequency ± 500 Hz	Minimum Sound Pressure dB (A) at Two Feet		Operating Voltage ✻ AC/DC Non-Polar All Others DC Only		Typical Operating Current (mA)	
					At Min V	At Max V	■ Min	Max	At Min V	At Max V
• SC110K	Medium	Panel	E	2900	68	80	✻ 30	120	6	22
SC250K	Medium	Panel	E	2900	68	80	✻ 60	250	5	18
SC628K	Medium	Panel	D	2900	68	80	6	28	3	14
SC628AK	Medium	Panel	E	2900	68	80	✻ 6	28	4	16
SC648AK	Medium	Panel	E	2900	68	80	✻ 10	48	6	24
SC110FK	Soft	Panel	E	2900	55	65	✻ 30	120	4	16
SC250FK	Soft	Panel	E	2900	52	65	✻ 60	250	4	16
SC628FK	Soft	Panel	D	2900	50	65	6	28	3	14
SC628AFK	Soft	Panel	E	2900	55	70	✻ 6	28	2	8

Intermittent Tones

Bold Type Denotes New Products

Fast Pulse (1)	Slow Pulse (2)	Loudness Category	Mounting Method	Case Style	Frequency ± 500 Hz	Minimum Sound Pressure dB (A) at Two Feet		Operating Voltage ✻ AC/DC Non-Polar All Others DC Only		Typical Operating Current (mA)	
						At Min V	At Max V	■ Min	Max	At Min V	At Max V
SC110NP	SC110NJ	Loud	Panel	D	2900	80	95	✻ 30	120	8	28
SC616NP	SC616NJ	Loud	Panel	C	2900	80	95	6	16	4	16
▸ SC616NP-10	–	Loud	Panel	D-4	2900	80	95	6	16	6	18
SC628ANP	SC628ANJ	Loud	Panel	D	2900	80	95	✻ 6	28	8	28
SC648ANP	SC648ANJ	Loud	Panel	D	2900	80	95	✻ 10	48	8	28
SBM616P	SBM616J	Medium	Printed Board	F	2900	68	78	6	16	1	4
SC110DP	SC110DJ	Medium	Panel	E	1900	60	75	✻ 30	120	4	16
SC110HP	SC110HJ	Medium	Panel	E	4500	68	80	✻ 30	120	4	16
• SC110P	• SC110J	Medium	Panel	E	2900	68	80	✻ 30	120	6	21
SC250DP	SC250DJ	Medium	Panel	E	1900	60	72	✻ 60	250	4	16
SC250HP	SC250HJ	Medium	Panel	E	4500	68	80	✻ 60	250	4	16
SC250P	SC250J	Medium	Panel	E	2900	68	78	✻ 60	250	4	16
SNP616P	SNP616J	Medium	Snap In Panel	B-1	2900	65	75	6	16	1	5
SC616P	SC616J	Medium	Panel	C-1	2900	68	78	6	16	1	4
SC616P-1	SC616J-1	Medium	Panel	C-11	2900	68	78	6	16	1	4
SC628ADP	SC628ADJ	Medium	Panel	E	1900	60	75	✻ 6	28	4	16
SC628AHP	SC628AHJ	Medium	Panel	E	4500	68	80	✻ 6	28	4	16
SC628AP	SC628AJ	Medium	Panel	E	2900	68	80	✻ 6	28	4	16
SC628DP	SC628DJ	Medium	Panel	D	1900	60	75	6	28	3	14
SC628HP	SC628HJ	Medium	Panel	D	4500	68	80	6	28	3	14
• SC628P	• SC628J	Medium	Panel	D	2900	68	80	6	28	6	26
SC648ADP	SC648ADJ	Medium	Panel	E	1900	60	75	✻ 10	48	4	16
SC648AP	SC648AJ	Medium	Panel	E	2900	68	80	✻ 10	48	4	16
SC110EP	SC110EJ	Soft	Panel	E	1900	55	65	✻ 30	120	3	14
SC110FP	SC110FJ	Soft	Panel	E	2900	55	65	✻ 30	120	4	16
SC250EP	SC250EJ	Soft	Panel	E	1900	55	68	✻ 60	250	3	14
SC250FP	SC250FJ	Soft	Panel	E	2900	55	65	✻ 60	250	4	16
SC628AEP	SC628AEJ	Soft	Panel	E	1900	50	65	✻ 6	28	3	14
SC628AFP	SC628AFJ	Soft	Panel	E	2900	50	65	✻ 6	28	4	16
SC628EP	SC628EJ	Soft	Panel	D	1900	50	65	6	28	3	8
SC628FP	SC628FJ	Soft	Panel	D	2900	50	65	6	28	3	14

(1) Turns on and off at 2 to 10 pulses per second depending upon voltage at 50% duty cycle.
(2) Turns on and off at .5 to 2 pulses per second depending upon voltage at 50% duty cycle.

▸ Pulse rate 2 to 10 pps with 10 second shutoff
• Denotes UL Models

✻ For both DC or AC Operation (AC Voltage is RMS for 50 or 60 Hz Power Line)

■ Minimum voltage specified for sound test does not represent sound turn-on or turn-off points. Units will sound at lower voltages.

Commercial and Industrial
Sonalert® Audible Signal Devices

MALLORY

Catalog Number	Loudness Category	Mounting Method	Case Style	Frequency ± 500 Hz	Minimum Sound Pressure dB (A) at Two Feet		Operating Voltage ✻ AC/DC Non-Polar All Others DC Only		Typical Operating Current (mA)	
					At Min V	At Max V	■ Min	Max	At Min V	At Max V
Dual Mode Operation										
Continuous or Fast Pulse (1) / **Continuous or Slow Pulse (2)**	When power terminals are connected, third terminal may be switched to open to select a continuous sound or switched to positive (+) to select a pulsing sound. Switching current is less than 2.0 milliamp.									
SC616NPU	Loud	Panel	D-1	2900	80	90	6	16	4	16
SBM616PU / SBM616JU	Medium	Printed Board	F	2900	68	78	6	16	3	12
SC616PU / SC616JU	Medium	Panel	C-7	2900	68	78	6	16	3	12
▶ SC616PU-1 / SC616JU-1	Medium	Panel	C-7	2900	68	80	6	16	3	12
Warble										
Fast Warble (1) / **Slow Warbl(2)**										
» — — / SC616JW	Medium	Panel	C	1800-2800	68	80	6	16	6	22
Single package warbler. Pulse rate is 1.5pps (typical) @ 50% duty cycle.										
SC628W / SC628JW	Medium	Panel	D-1	2900	68	80	6	28	3	16
Produces two tones alternately when used with additional continuous tone unit (Use with SC628D or SC628H)										
SC628FW / SC628FJW	Soft	Panel	D-1	2900	55	70	6	28	3	14
Produces two tones alternately when used with additional continuous tone unit (Use with SC628E)										
Chime Tone	A pleasant sound which chimes every one or two seconds as long as voltage is applied. Pulse rate is 0.3 to 2 pps at 50% duty cycle.									
SC110CP	Medium	Panel	E	2900	68	78	✻ 30	120	4	16
SC616CP	Medium	Panel	D	2900	68	78	6	16	3	8
SC616CPN	Loud	Panel	D	2900	76	86	6	16	6	16
Chirp	A unique sound which pulses at 20 to 60 pps.									
• SC110Q (AC Only)	Medium	Panel	C	2900	68	80	30 AC	120 AC	6	22
SC616Q	Medium	Panel	C-1	2900	68	78	6	16	1	4
Siren Tone										
» SC648S	Loud	Panel	D	1900-2900 ± 300 Hz	80	90	10	48	25	35
Sweep rate @ 5Hz (typical) ±1.5Hz										

(1) Turns on and off at 2 to 10 pulses per second depending upon voltage at 50% duty cycle.
(2) Turns on and off at .5 to 2 pulses per second depending upon voltage at 50% duty cycle.

• Denotes UL Models

✻ For both DC or AC Operation (AC Voltage is RMS for 50 or 60 Hz Power Line)

■ Minimum voltage specified for sound test does not represent sound turn-on or turn-off points. Units will sound at lower voltages.

▶ Has two negative hook-ups

» **Denotes a NEW Product**

Environmental Specifications

Surge Voltage
15% over maximum rated voltage applied for less than one minute.

Reverse Voltage – DC Models
Maximum reverse polarity equal to rated voltage for one minute. Some models may sound softly when subjected to reversed polarity voltage.

Life Specification
Continuous – 250 hours continuous operation at 65°C with maximum rated voltage applied.

Intermittent – A duty cycle of 1 minute on, 5 minutes off, a minimum of 10,000 times at room temperature and maximum rated voltage applied.

Life Expectancy
7 years under normal operating conditions

Storage Temperature
-40°C to +85°C

Operating Temperature
-30°C to +65°C

Humidity
The Sonalert® signal should operate after having been subjected to 95% Relative Humidity at +40°C continuously for 100 hours. After removal from test, the unit should be allowed to dry a minimum of 4 hours at room temperature before operation. Units should deliver original output characteristics.

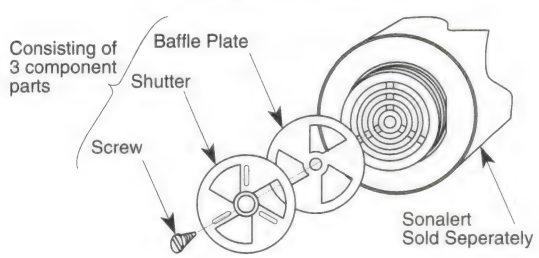
Vibration
The Sonalert signal should be mounted in the standard manner on a mounting panel. The specimens should be subjected to a harmonic motion having an amplitude of 0.03 inch (0.06 inch maximum total excursion). The frequency should be varied uniformly between a limit of 10 and 55 Hertz. The entire frequency range from 10 to 55 Hertz and return to 10 Hertz should be traversed in approximately one minute. Motion should be applied for two hours in each of 3 mutually perpendicular planes (total 6 hours). This test should be conducted while the Sonalert signal is not operating. After completion of test, Sonalert signals should meet specifications.

Salt Spray
The Sonalert signal should meet specified operating conditions after completing 96 hours in an atomized salt spray while not operating. The spray should consist of a 5% salt solution atomized by a forced air supply. The solution should be sprayed through a nozzle into a chamber maintained at 35°C. After salt spray, the unit should be removed and washed in running water not warmer than 40°C. A soft hairbrush or plastic bristle brush should be used, lightly brushing to remove salt deposits from the unit. The cleaned Sonalert signals should be placed on absorbent material with the nose pointed downward and allowed to dry at room temperature for 24 hours prior to use.

"EXCEPT SBM & SNP MODLES"

Terminal Strength
5 pounds, applied axially for a period of 5 minutes. This is considered a destructive test.

Manual Volume Control



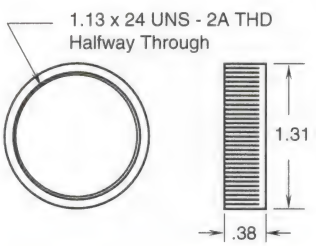
Catalog Number SCVC

Electrical Mounting Box

Used to mount Sonalert® signal case styles C and D on standard 3/4" electrical conduit. 3 - 1/2" diameter, 2" deep ABS plastic.

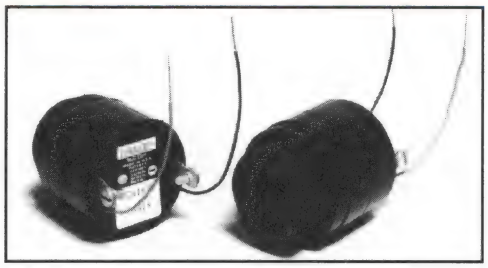
Catalog Number SCMB

Sonalert® Mounting Nuts



Material	Catalog Number
Anodized Black Aluminum (Standard on Military units)	**BNR1**
Anodized Clear Aluminum	**CNR1**
Black Plastic (Nylon 6/6) (Standard on Industrial and Commercial units)	**PNR1**

Multi-Tone
Sonalert® Audible Signal Devices



Models SC616WY & SC616WXY

Key Features

The Multi-Tone Sonalert models SC616WY and SC616WXY are piezoelectric signaling devices with several functions. When operated and controlled from a 6-16 VDC source, they produce distinctive tone patterns. The SC616WY tone patterns are pulsate high frequency, pulsate low frequency and warble. The SC616WXY has two additional tones - continuous high and low frequency. Operating modes are determined by the connection of two control wires.

The Multi-Tone Sonalert employs all solid state circuitry. When driven at the maximum supply voltage, a sound pressure of 72 dB at 2 feet is obtained. Both models have a low current drain (27 mA max).

Mechanical

Outline drawing and dimensions - See below.

Case Material:	Nylon
Mounting method:	Panel
Terminals:	.032 brass, tin plated, tapped for #6-32 screw. Two #6-32 nickel plated brass screws included.

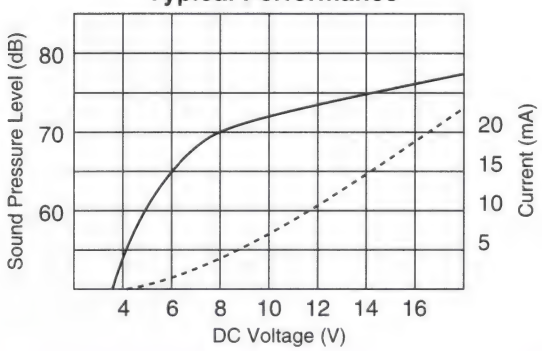
Will accept 1/4" quick disconnect terminals (non-standard).

Control wire size:	24AWG, stranded, 6" long
Operating temperature:	-30°C to +65°C

Control Functions

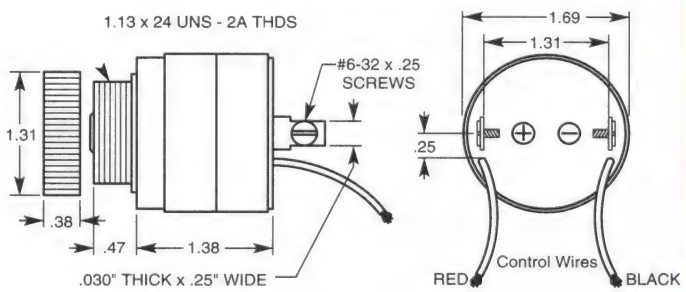
The red and black leads control the several functions. A logic "Low" is a voltage less than 1/3 of supply voltage. A logic "High" is a voltage greater than 1/2 supply voltage. A red or black input lead left unconnected is considered an open state.

Typical Performance



Dimensions

(Case Style D-2)



Electrical

Catalog Number	Voltage		Typical Current mA		High Tone Frequency ± 500	Low Tone Frequency ± 500	Pulse Rate Per Second ★	Minimum Sound Pressure dB at Two Feet	
	Min.	Max.	At Min. V	At Max. V				At Min. V	At Max. V
SC616WY	6	16	2	18	3000	1750	.5 - 1.2	60	72
SC616WXY	6	16	2	18	3000	1750	.5 - 1.2	60	72

★ 50% Duty Cycle

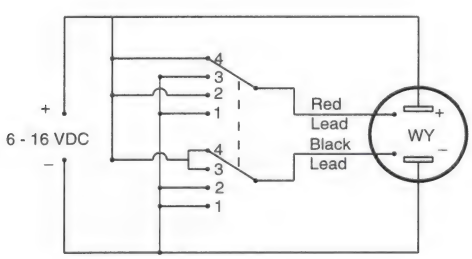
Truth Table for SC616WY

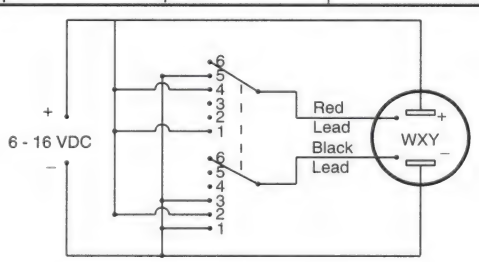
Control Lead		Function Mode
Red	Black	
Low	Low	Off
High	Low	High Pulse
Low	High	Low Pulse
High	High	Warble

Truth Table for SC616WXY

Control Lead		Function Mode
Red	Black	
High	Low	Off
Open	High	High Continuous
Open	Low	Low Continuous
High	Open	High Pulse
Low	Open	Low Pulse
Open	Open	Warble

Schematics: Set to Warble

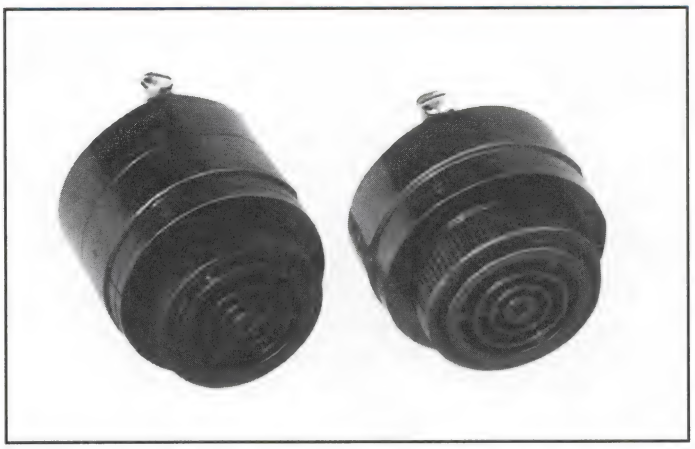




Sound Devices

Military
Sonalert® Audible Signal Devices

MALLORY



For applications requiring operation over extended temperature ranges, or in extreme environmental conditions, military models are recommended. These special units use MIL approved components if available. Exposed surface of the sound transducer is treated with a corrosion protective coating. Mounting nut is anodized aluminum. Terminals are tin plated brass with nickel plated 6-32 screws. All units are marked with Mallory logo, part number, polarity and date code per MIL-STD-1285. Marking is permanently preserved by a layer of clear epoxy. Customer part number may be included on label if desired. A certificate of compliance to NACC specifications will be supplied if requested.

Black plastic case and black anodized aluminum mounting nut is standard. To specify olive drab case and mounting nut, add G to part number. *Example*: SC628MG. To specify black case and clear anodized mounting nut, add C to part number. *Example*: SC628MC.

Quality Specifications

Operating
100% measurement of sound output and frequency at +25° C. Data is supplied with parts. Operation of each part confirmed at -40° C and +85° C.

Environmental
MIL Std. 105D Level II single normal inspection .65 AQL

Life Specifications
500 hours continuous operation at 85° C and maximum rated voltage applied. 10,000 cycles one minute on, 5 minutes off at 25° C and maximum rated voltage applied.

LIfe Expectancy
10 years under normal operating conditions

Operating Temperature
-40° C to +85° C

Storage Temperature
-65° C to +85° C

Altitude Change
10,000 feet per minute maximum

Environmental Specifications

Test	MIL-STD-202 Method	Test Condition
Thermal shock	107	A
Humidity	103	B
Salt spray	101	A
Shock	213	H
Vibration	201	None
Terminal strength	211	A (5 lbs.)

Because the operation of the Sonalert audible signal device is dependent upon the circuit in which it is used, it is advisable to thoroughly test the selected device in the specific circuit and application to assure mechanical and electrical compatibility and verify system performance.

North American Capacitor Co. Cage Code – 37942

Catalog Number	Loudness Category	Mounting Method	Case Style	Frequency ± 500 Hz	Minimum Sound Pressure dB (A) at Two Feet		Operating Voltage ✻ AC/DC Non-Polar All Others DC Only		Typical Operating Current (mA)	
					At Min. V	At Max. V	■ Min.	Max.	At Min. V	At Max.V
Bold Type Denotes New Products				**Continuous Tones**						
SC616MN	Loud	Panel	C-8	2900	80	95	6	16	6	22
SC628MN	Loud	Panel	C	2900	80	90	6	28	4	16
SC628M	Medium	Panel	C	2900	68	80	6	28	3	14
SC628MD	Medium	Panel	C	1900	60	75	6	28	3	14
SC628MH	Medium	Panel	C	4500	68	80	6	28	3	14
SC648M	Medium	Panel	C	2900	68	80	10	48	3	14
SC648MD	Medium	Panel	C	1900	60	75	10	48	3	14
SC628MA	Medium	Panel	D	2900	68	80	✻ 6	28	4	16
SC628MAH	Medium	Panel	D	4500	68	80	✻ 6	28	4	16
SC648MA	Medium	Panel	D	2900	68	80	✻ 10	48	4	16
SC648MAH	Medium	Panel	D	4500	68	80	✻ 10	48	4	16
SC110M	Medium	Panel	D	2900	68	80	✻ 30	120	4	16
SC110MH	Medium	Panel	D	4500	68	80	✻ 30	120	4	16
SC250M	Medium	Panel	D	2900	68	80	✻ 60	250	4	16
				Fast Pulse						
				Turns on and off at 2 to 9 pulses per second depending upon voltage at 50% duty cycle.						
SC628MNP	Loud	Panel	D	2900	80	90	6	28	4	16
SC628MP	Medium	Panel	D	2900	68	80	6	28	3	14
SC628MHP	Medium	Panel	D	4500	68	80	6	28	3	14
				Fast Warble						
				Produces two tones alternately when used with additional continuous unit.						
SC628MW	Medium	Panel	D-1	2900	68	80	6	28	3	16
				Continuous or Fast Pulse						
				Dual mode operation.						
SC616MPU	Medium	Panel	C-7	2900	68	78	6	16	3	12

» **Denotes a NEW Product**

✻ For both DC or AC Operation (AC Voltage is RMS for 50 or 60 Hz Power Line)

■ Minimum voltage specified for sound test does not represent sound turn-on or turn-off points. Units will sound at lower voltages.

Models VSB110-1 & VSB110-2
Sonalert® Crosswalk Audible Signal Devices

NEW

MALLORY

- Made in USA
- Panel Mounting
- High-Quality Analog Record / Playback
- Bird Calls
- 3- WayTerminals
- Environmentally Sealed

GENERAL SPECIFICATION

Resonant Frequency:
800 & 1,200 Hz (Cuckoo)
2,000 Hz (Chirp)

Minimum Sound Pressure
@ 120 VAC, 60 HZ:
80 db(A) @ 2ft.

Rated Voltage:
110/120 VAC @ 60 HZ

Maximum Current:
30 mA @ 120 VAC

Operating Temperature:
-40°C to +85°C

Storage Temperature:
-40°C to +85°C

APPLICATIONS

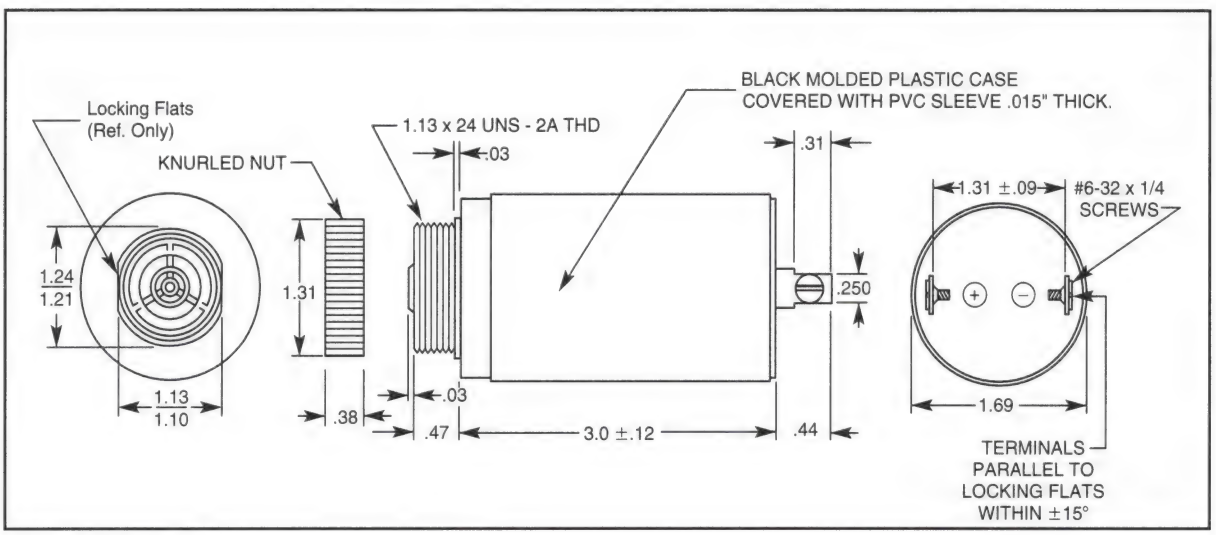
Audible Signal For
Pedestrian Crosswalks

Characteristics

VSB110-1: Cuckoo (North - South)
800 HZ & 1,200 HZ
Repeats approximately every 1.5 seconds

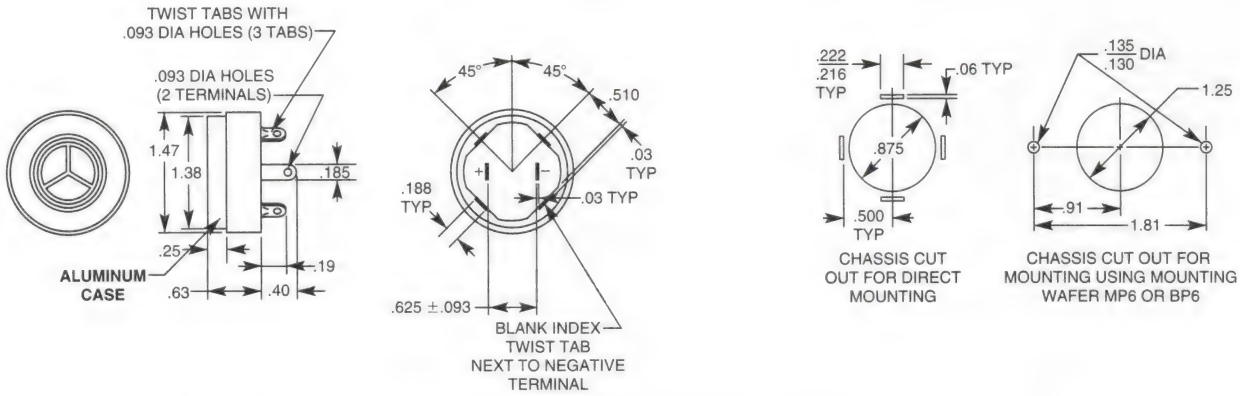
VSB110-2: Chirp (East - West)
2,000 HZ
Repeats approximately every 1 second

Shape and Dimensions (Inches)



Sound Devices

Case Style A

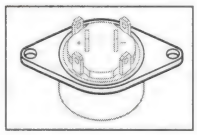


Terminals - .032 steel, tin plated with .093 dia. wire hole, will accept standard 3/16" quick disconnect.

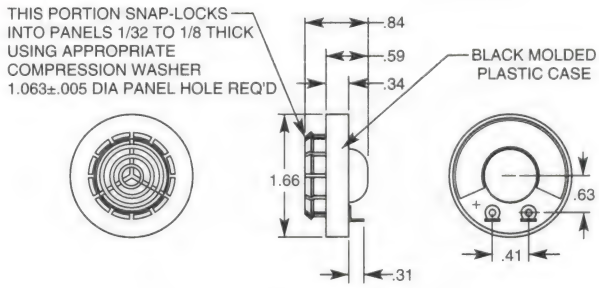
Mounting - Four Twist Tabs per EIA std. RS395 are provided for mounting. Terminals are electrically isolated from case and Twist Tabs.

Also may be mounted using wafer.
MP6 for uninsulated mounting
BP6 to insulate case from chassis.

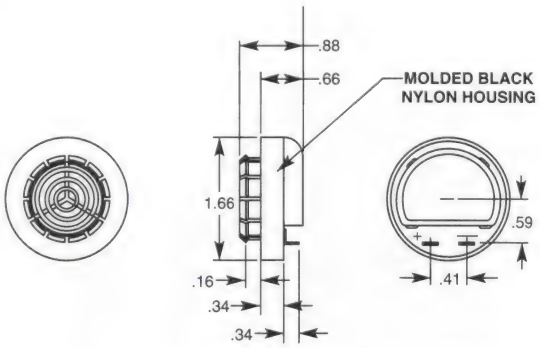
Bakelite Mounting Wafer Catalog No. BP6



Case Style B



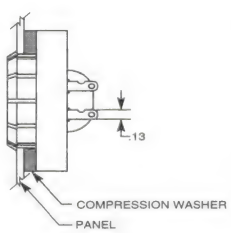
Case Style B - 1



Terminals - .022 brass, hot tin finish with .065 wire hole.
Terminal will accept standard 1/8" quick disconnect.

Typical Panel Installation
Case Style B

Mounting - Panel hole 1.063 ± .005 diameter should be punched from the back side so that locking fingers enter on the slightly rounded edge of the hole. Assemble proper **compression washer** and press into panel hole until locking fingers snap over hole edge. Installation pressure should be applied only at the circumferance of the device.

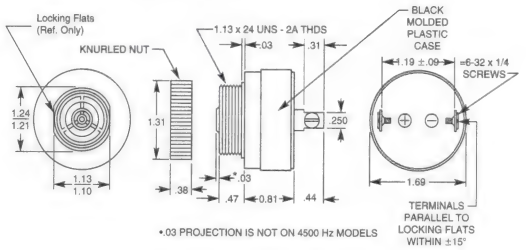


Compression Washer

Catalog Number	Thickness	Panel Thickness
PW1	.063	11-12GA (.125-.109)
PW2	.125	13-17GA (.093-.056)
PW3	.187	18-22GA (,050-.031)

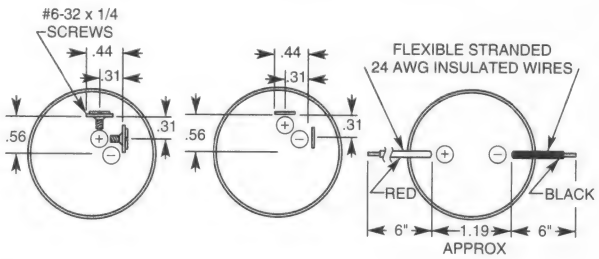
Material: Black ester foam Compression 5:1
Size : 1.06" I.D. x 1.50" O.D. (Ref.)

Case Style C



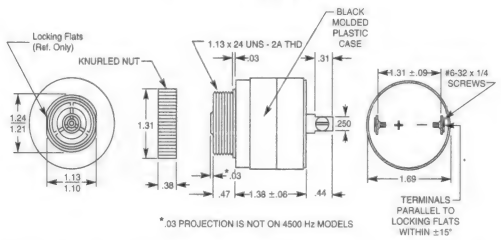
C-8: Same as Style C except terminal spacing is 1.31".

Case Style C-1 C-2 C-3



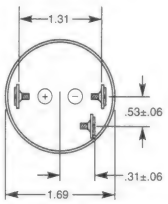
C-11: Same as Style C-2 except terminal height is .56".

Case Style D



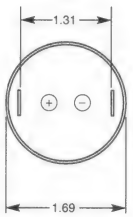
Terminals - .032 brass, tin plated, tapped for #6-32 screw. Two #6-32 nickel plated brass screws included. Will accept 1/4" quick disconnect with 3/16" opening

Case Style D-1 and C-7



Mounting - Remove black plastic nut and insert threaded front through 1.25" hole punched in panel. If orientation is needed, note locking flats on drawing. Screw nut back on. Do not overtighten.

Case Style D-4

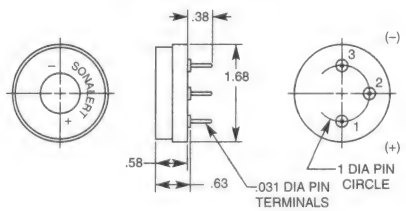


Optional Mounting Nuts - To substitute natural finished aluminum or anodized black aluminum nut for the standard plastic nut, purchase catalog numbers 'CNR1' or 'BNR1' respectively as shown on page 184.

Case Style E

Outline dimensions are the same as case style D except length is changed to 1.94" ±.094" (1-15/16 ± 3/32).

Case Style F



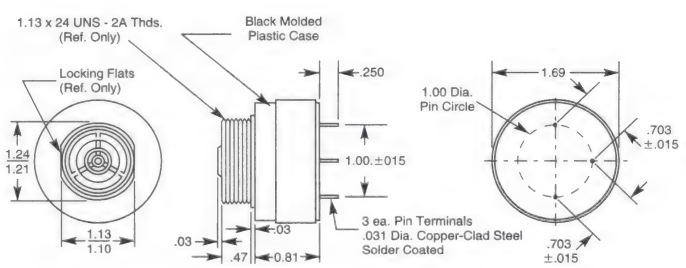
Terminals - .031 dia. soldercoated copperclad steel

Mounting - Insert into printed circuit board and hand or machine solder.

Electrical Connections - SBM2, SBM428, SBM616P, SBM616J - When pin 1 is connected to + voltage and pin 3 is connected to common (-), unit will sound. Pin 2 is for mechanical support only and is not connected internally.

SBM616PU, SBM616JU - When pin 1 is connected to + voltage, and pin 3 is connected to common (-), and the voltage on pin 2 is within 1.25V of pin 1 or higher, the unit will sound a pulsing tone. When the voltage on pin 2 is within .9V of pin 3 or lower, the unit will sound a continuous tone. The maximum voltage which may be applied to pin 2 before damage may occur is ± 16V referenced to pin 3. Pin 2 input impedence is 110K ohm.

Case Style G



Mounting - Insert Pin Terminals into Circuit Board and Solder

Loudness

The loudness of sound heard from a Sonalert signal depends upon, among other things, the hearing sensitivity of the listener, the frequency of the sound, the distance to the listener, the density and humidity of the air, the design of the Sonalert signal and the voltage applied. Technically, loudness as perceived by the human ear, is measured in sones and this unit may be used to judge the relative loudness between sounds. For example, a sound with a loudness of 4 sones will sound about 4 times louder than a sound of 1 sone. Because loudness at the listener's location is dependent upon the environment, it is not specified for Sonalert signals.

Sound Pressure

Sonalert signals generate air pressure waves which travel through the air to the listener's ear where they produce a sensation of sound. The amount of pressure produced depends upon the loudness and the frequency ratings of the Sonalert signal. Sonalert signal frequencies have been selected for maximum loudness with minimum amount of sound pressure.

Measurements of sound air pressure are expressed as a ratio compared to a pressure of .0002 dynes per square centimeter. This is the smallest sound pressure heard by the average person. The largest pressure that can be heard before pain is felt is about 3 million times higher. For measurement convenience, this wide pressure range is converted to a logarithmic ratio and expressed decibels (dB) according to the formula:

$$dB = 20 \text{ Log } \frac{\text{measured pressure}}{.0002 \text{ dynes/cm}^2}$$

The threshold of hearing has a ratio of 1:1, or a dB of 0. The threshold of pain has a ratio of 3 million:1, or a dB of 130.

Sound Pressure Change with Distance

When the sound pressure leaves the Sonalert signal, it radiates in all directions and is about 2 or 3 dB greater in the direction the open grill is facing. As the sound pressure travels towards the listener, it covers a greater area with a corresponding reduction in pressure at any one point until it is below the threshold of hearing.

For distances shorter than 50 meters, sound pressure drops 6 dB each time the distance traveled is doubled. Variations as much as ±8 dB may occur inside a room or around large objects such as buildings due to echo cancellation and reinforcement effects.

For distances longer than 2KM, air friction reduces sound air pressure about 10 dB/KM @ 1500 Hz, and 20 dB/KM @ 3000 Hz. Of course, the reduction in sound pressure between stationary points also depends upon wind direction and turbulence.

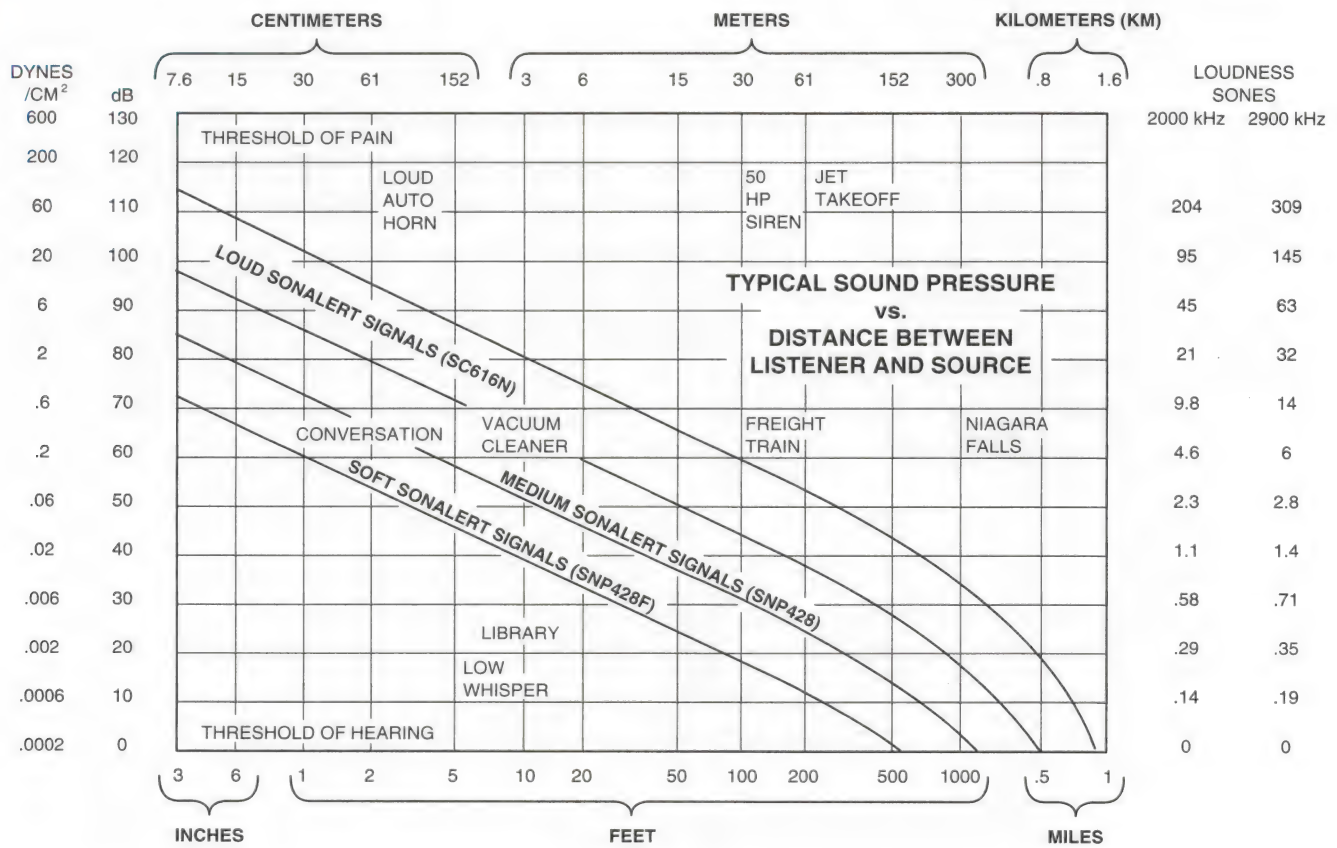
Perhaps the loudest known sound was caused by the eruption of Mt. Krakatua in 1883 which was estimated at 170 dB at 3 miles.

Sound Pressure Specifications

Since sound pressure decreases as it travels from the Sonalert signal, standard measurements must be made at a standard distance. Standard measurements are made at a distance of 2 feet in an anechoic chamber; or 10 feet above the ground in an open area with no wind. Sound pressure specifications for all Sonalert signal models are shown in the Catalog Number lists.

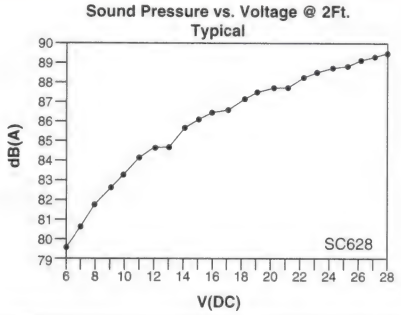
Frequency

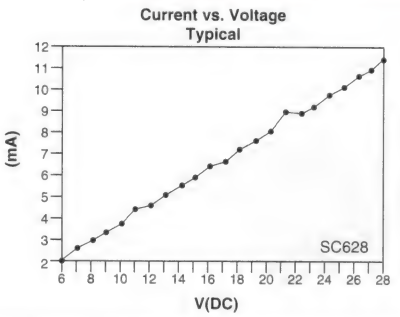
Each Sonalert signal model has its own frequency (tone) which cannot be changed. Models are available to provide frequencies from 1900 to 4500 Hz. For equal sound pressure, 1900 Hz Sonalert signals sound softer and more pleasant than 2900 Hz and 4500 Hz Sonalert signals.

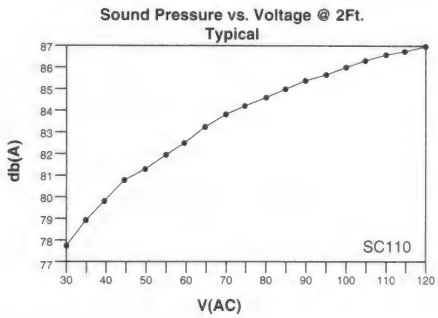


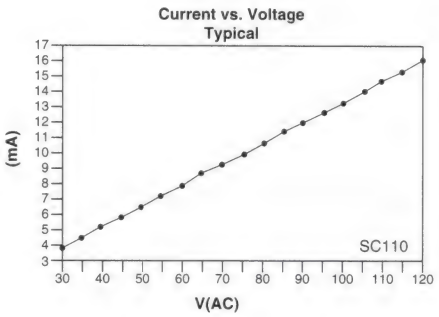
Typical Performance Curves
Sonalert® Audible Signal Devices

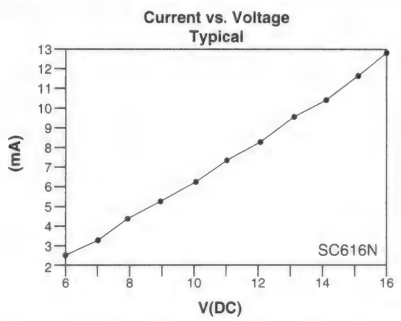
MALLORY

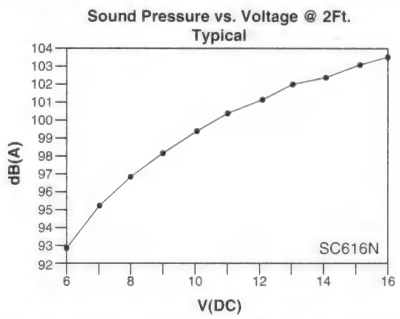


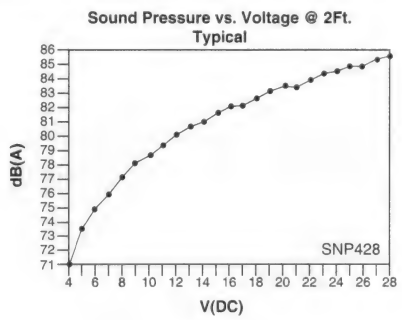


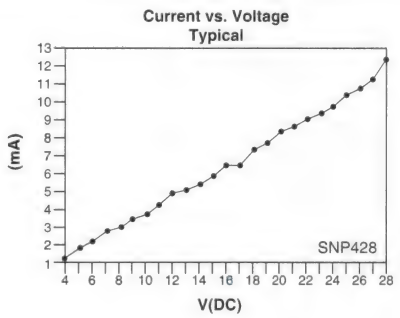


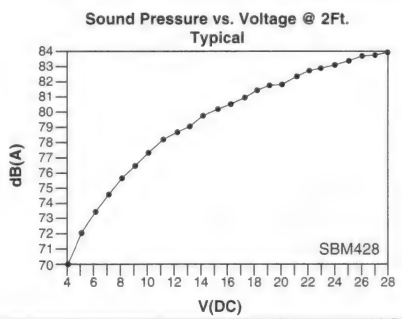


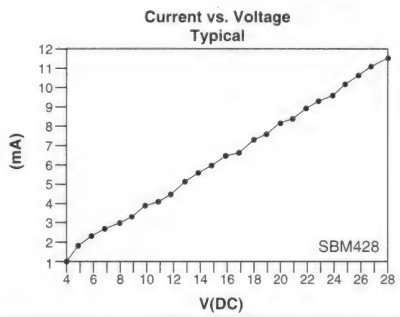




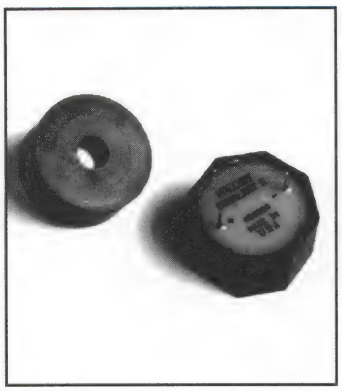








Models MSR320 & MSO320
Sonalert II™ Audible Signal Devices



- Made in USA
- Low Power Consumption
- Low Cost
- Low Profile and Compact
- Piezo Tone Quality
- Wave Solderable

GENERAL SPECIFICATION

Resonant Frequency:
3.40 ±.4 kHz (MSR)
3.15 ±.4 kHz (MSO)

Min. Sound Pressure @ 12VDC
75 db(A) @ 2ft.

Rated Voltage:
3-20 VDC to +65°C

Max. Current:
3-16 mA @ 3-20 VDC

Operating Temperature:
-20°C to +65°C

Storage Temperature:
-30°C to +80°C

Solder Temperature:
+270°C for 3 seconds

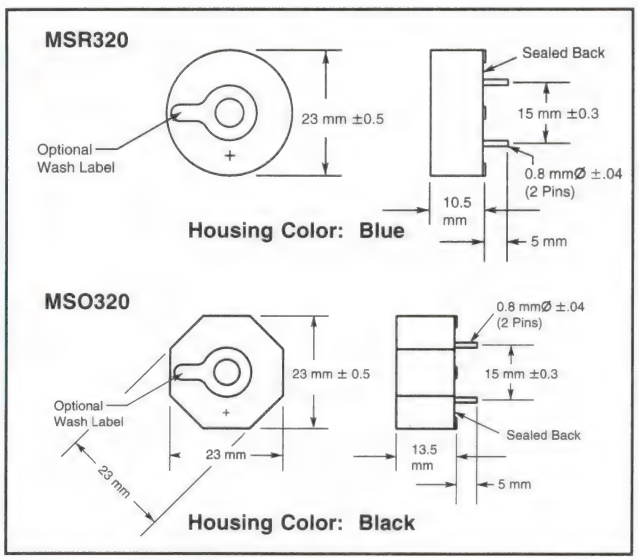
Case Material
VALOX (UL94V-0)

Weight (Typical):
3.5 grams

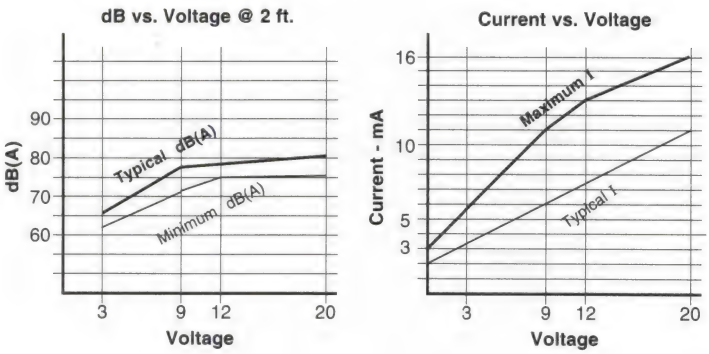
APPLICATIONS

Fire Alarm,
Crime Prevention Alarm,
Call Buzzer,
Automotive,
Clocks,
Cash Registers & P.O.S. Equipment,
Medical Instruments,
Electrical Instruments

Shape and Dimensions (mm)



Characteristics



The MSR320 and MSO320 are piezoelectric audible signal devices with a built-in oscillator circuit. They are suitable replacements for the MCP320B2 and MCP320.

The MSR320 and MSO320 are suitable for wave soldering when ordered with the sound emission hole covered with a wash label. The recommended maximum temperature and exposure time for wave soldering is +270° C and 3 seconds respectively.

Optional wash label may be ordered by adding 'S' to model number.

Example: MSR320S
MSO320S

Parts similar to MSR320 & MSO320 have passed ESD (ElectroStatic Discharge) testing to levels 1, 2 & 3 per MIL-STD-883D.

Typical Reference Conditions for Various Applications

Sound Pressure @ 12VDC

90 db(A)	@	10 cm
81 db(A)	@	30 cm
75 db(A)	@	2 ft. (Spec)
72 db(A)	@	100 cm

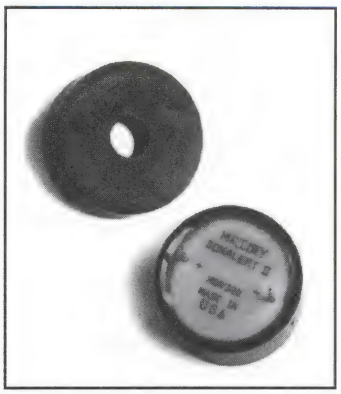
Because the operation of the Sonalert II audible signal device is dependent upon the circuit in which it is used, it is advisable to thoroughly test the selected device in the specific circuit and application to assure mechanical and electrical compatibility and verify system performance.

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Models MSR516N, MSR516NP, & MSR516NJ
Sonalert II™ Audible Signal Devices - Extra Loud

NEW

MALLORY



- Made in USA
- Low Power Consumption
- Low Cost
- Low Profile and Compact
- Piezo Tone Quality
- Wave Solderable
- Extra Loud Sound Output

GENERAL SPECIFICATION

Resonant Frequency:
3.40 ±.4 kHz

Min. Sound Pressure @ 12VDC
85 db(A) @ 2ft.

Rated Voltage:
5-16 VDC to +65°C

Max. Current:
3-16 mA @ 5-16 VDC

Pulse Rate:
2-10pps (MSR516NP)
.5-2 pps (MSR516NJ)

Operating Temperature:
-20°C to +65°C

Storage Temperature:
-30°C to +80°C

Solder Temperature:
+270°C for 3 seconds

Case Material (Blue)
VALOX (UL-94V0)

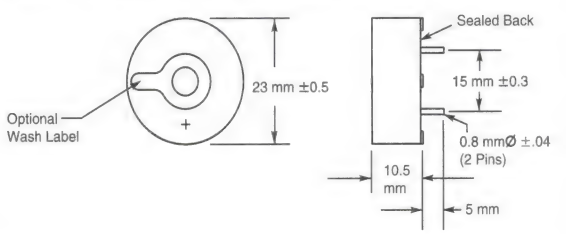
Weight (Typical):
3.5 grams

APPLICATIONS

Fire Alarm,
Crime Prevention Alarm,
Call Buzzer,
Automotive,
Clocks,
Cash Registers & P.O.S. Equipment,
Medical Instruments,
Electrical Instruments

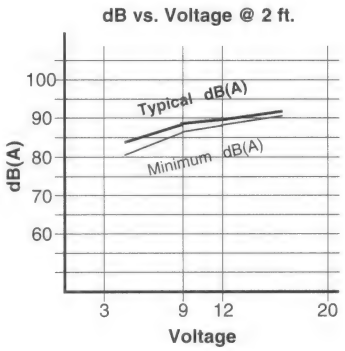
Shape and Dimensions (mm)

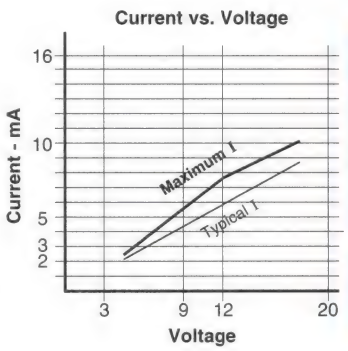
MSR516N, MSR516NP, & MSR516NJ



MSR516N - Continuous
MSR516NP - Fast Pulse
MSR516NJ - Slow Pulse

Characteristics





The MSR516N, MSR516NP, and MSR516NJ are piezoelectric audible signal devices with a built-in oscillator circuit. They are suitable replacements for the MCP320B2.

The MSR516N, MSR516NP, and MSR516NJ are suitable for wave soldering when ordered with the sound emission hole covered with a wash label. The recommended maximum temperature and exposure time for wave soldering is +270° C and 3 seconds respectively.

Optional wash label may be ordered by adding 'S' to model number.

Example: MSR516NS

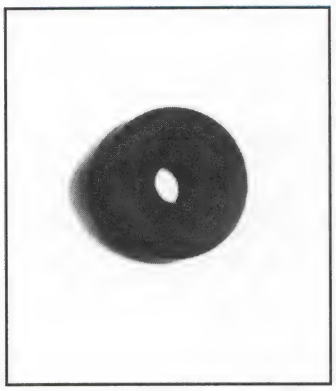
Typical Reference Conditions for Various Applications

Sound Pressure @ 12VDC

100 db(A)	@	10 cm
91 db(A)	@	30 cm
85 db(A)	@	2 ft. (Spec)
82 db(A)	@	100 cm

Because the operation of the Sonalert II audible signal device is dependent upon the circuit in which it is used, it is advisable to thoroughly test the selected device in the specific circuit and application to assure mechanical and electrical compatibility and verify system performance.

Type MCP320
Minilert Audible Signal Devices



- Low Power Consumption
- Low Cost
- Piezoelectric Tone Quality
- Wave Solderable
- Compact

GENERAL SPECIFICATIONS

Resonant Frequency:
3.15 ± 0.5 kHz

Min. Sound Pressure (dB/2 Ft.):
55 dB @ 3 VDC, 74 dB @ 20 VDC

Rated Voltage to 70°C:
3-20 VDC

Max. Current:
3 mA @ 3 VDC & 20 mA @ 20 VDC

Operating Temperature:
-20°C to +70°C

Storage Temperature:
-30°C to +80°C

Solder Temperature:
270°C for 3 seconds

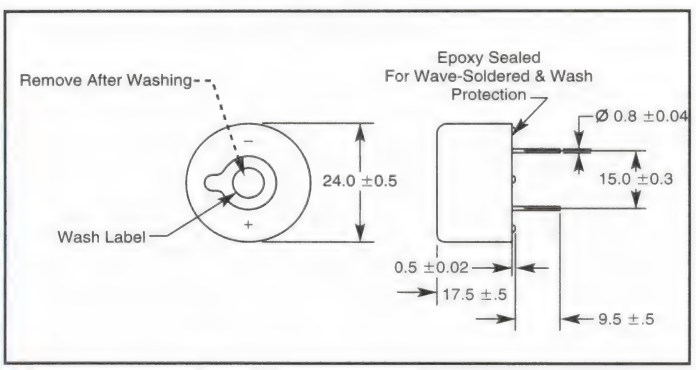
Case Material (Black):
ABS UL-94VO

Weight (Typical):
4.3 grams

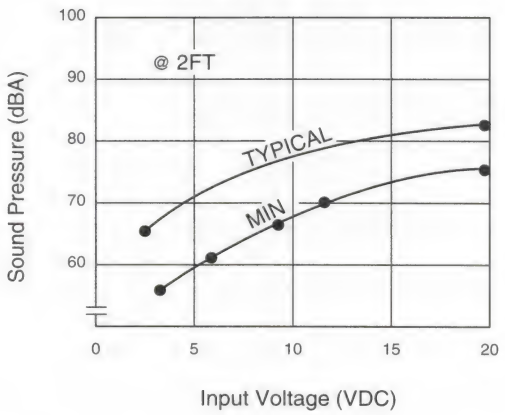
APPLICATIONS

Fire Alarms
Crime Prevention Alarms
Call Buzzers
Automotive
Clocks
Cash Registers & Point of Sale Equipment
Medical Instruments
Electrical Instruments

Shape and Dimensions (mm)

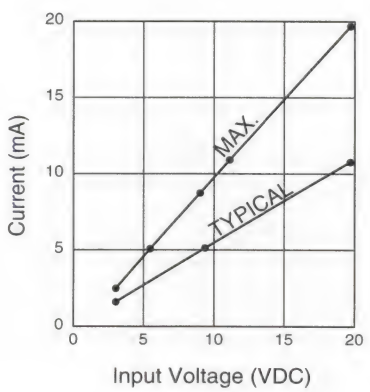


Characteristics



Replacement for MCP320B2

A piezoelectric audible signal with a built-in oscillator circuit. The MCP320 is suitable for wave soldering with the sound emission hole covered.



Made in Korea

Notice

Because the operation of the Minilert audible signal device is dependent upon the circuit in which it is used, it is advisable to thoroughly test the selected device in the specific circuit and application to assure mechanical and electrical compatibility and verify system performance.

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

Introduction to Mounted Piezo Transducers

NEW

MALLORY

Features

- Low current consumption and high sound output
- Extremely clear and penetrating sound
- Small size and light weight
- No electronic generated EMI or RFI

Applications

- Office equipment
- Communication equipment
- Home appliances
- Alarms
- Computers
- Vehicles

Part Numbering

P	☐	-	2	0	3	5	F	P	L

Transducer Type

Dimensions of piezo ceramic elements

Resonant frequency and form of case

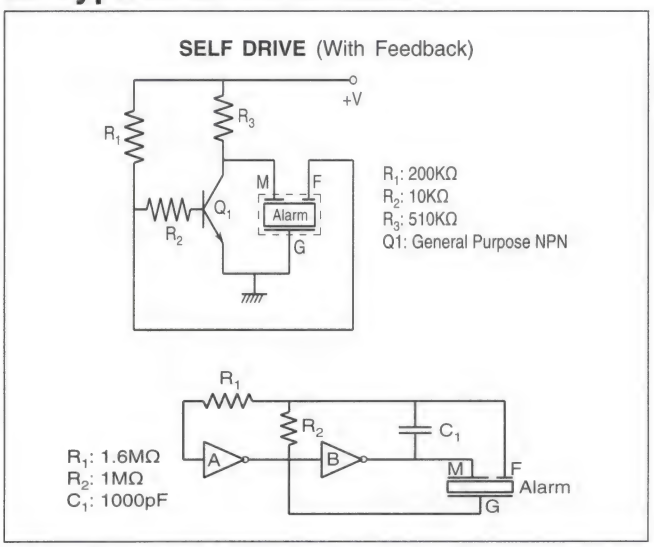
With feed back electrode (Self drive type)

Type of connections:
P - Pin type
W - Wire type

Longer pin type

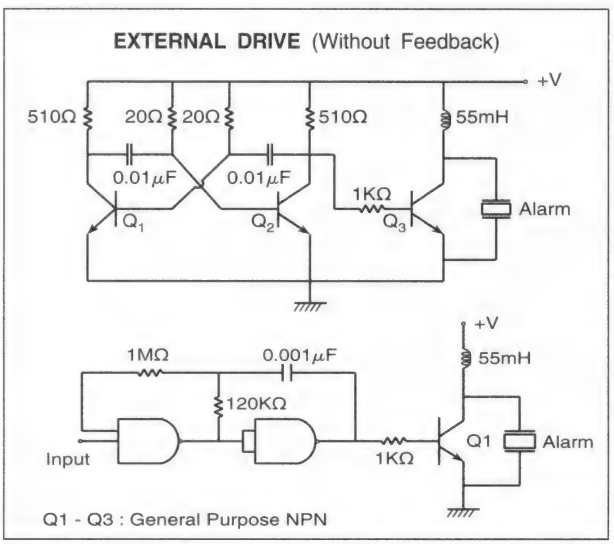
Transducers have no internal drive circuitry and must be driven by typical circuits as shown below.

Typical Drive Circuits



(M) Red + (G) Black - (F) Blue Feedback

Recommended IC'S:
MM74HC14: Natl. Semi.
MC14106B: Motorola
CD40106B: Harris
Input Voltage: Connect to V+ of IC
Ground: Connect to GND of IC



Recommended IC'S:
MC14011B: Motorola
CD10110B: Harris
Input Voltage: Connect to V+ of IC
Ground: Connect to GND of IC

Sound Devices

Mounted Piezo Transducers

NEW

MALLORY

(•Indicates part is sealed)

External Drive With NO Feedback

Catalog Number	Type	Resonant Frequency (kHz ± 0.5)	dB (Min) @ Res. Freq. 10cm, 5v square wave	Operating Voltage (Vp-p)	D x H	Figure	Mounting & Features	Pitch
PT-1540P	External Drive	4.0	80	25	17.0x7.0	1	P.C. Board - 2 pin	(10.0mm c/c)
PT-2040P	External Drive	4.0	90	30	22.0x7.0	1	P.C. Board - 2 pin	(10.0mm c/c)
PT-2060P	External Drive	6.0	80	30	24.0x5.5	1	P.C. Board - 2 pin	(10.0mm c/c)
PT-2725P	External Drive	2.5	90	30	30x10.0	1	P.C. Board - 2 pin	(15.0mm c/c)
PT-2020P	External Drive	2.0	80	80	22.0x26.5x7.0	5	2 blade	(12.5mm c/c)
PT-2726P	External Drive	2.5	90	30	30.0x10.0	1	P.C. Board - 2 pin	(15.0mm c/c)
PT-2130P	External Drive	3.0	90	25	24.0x9.5	1	P.C. Board - 2 pin	(15.0mm c/c)
PT-2736P	External Drive	3.5	90	30	30.0x10.0	1	P.C. Board - 2 pin	(17.5mm c/c)
PT-1240P	External Drive	4.1	80	20	13.8x7.5	1	P.C. Board - 2 pin	(7.6mm c/c)
PT-1250W	External Drive	4.8	80	25	13.8x4.0	1	2 wire	
PT-1550W	External Drive	5.0	80	25	16.8x4.0	1	2 wire	
PT-1540W	External Drive	4.0	80	25	17.0x7.0	2	Flange Mount (23.0 c/c) - 2 wire	
PT-2040W	External Drive	4.0	90	30	22.0x7.0	2	Flange Mount (28.5 c/c) - 2 wire	
PT-2038W	External Drive	3.8	95	30	24.0x5.0	2	Flange Mount (29.0 c/c) - 2 wire	
PT-2060W	External Drive	6.0	95	30	24.0x5.0	2	Flange Mount (29.0 c/c) - 2 wire	
PT-2725W	External Drive	2.5	90	30	30.0x10.0	2	Flange Mount (35.0 c/c) - 2 wire	
PT-2745W	External Drive	4.5	90	30	30.0x5.5	2	Flange Mount (35.0 c/c) - 2 wire	
PT-2746W	External Drive	4.5	90	30	30.0x5.5	1	2 wire	
PT-2130W	External Drive	3.0	90	30	24.0x9.5	2	Flange Mount (29.0 c/c) - 2 wire	
PT-2736W	External Drive	3.5	90	30	30.0x10.0	2	Flange Mount (39.0 c/c) - 2 wire	
PT-2726W	External Drive	2.5	80	30	30.0x8.7	3	Snap Mount - 2 wire	
PT-3529W	External Drive	2.8	100	30	42.0x16.0	2	Flange Mount (50.0 c/c) - 2 wire	

Sound Devices

» Denotes NEW Models

Self Drive WITH Feedback

Catalog Number	Type	Resonant Frequency (kHz ± 0.5)	dB (Min) @ 30cm, @ 12 VDC	Operating Voltage (Vp-p)	D x H	Figure	Mounting & Features	Pitch
PT-2035FP	Self Drive	3.5	86	3-28	23.4x11.0	4	3 blade - 3.0mm standoff	
PT-2035FPL	Self Drive	3.5	86	3-28	23.4x11.0	4	3 blade - 6.0mm standoff	
PT-2036FP	Self Drive	3.5	86	3-28	24.0x11.0	4	3 blade - 6.0mm standoff	
PT-2036FPL	Self Drive	3.5	86	3-28	24.0x11.0	4	3 blade - 12.0mm standoff	
PT-2725FP	Self Drive	2.5	85	3-28	30.0x10.0	4	3 blade - 3.0mm standoff	
PT-2725FPL	Self Drive	2.5	85	3-28	30.0x10.0	4	3 blade - 6.0mm standoff	
PT-2735FP	Self Drive	3.5	88	3-28	30.0x10.0	4	3 blade - 3.0mm standoff	
PT-2735FPL	Self Drive	3.5	88	3-28	30.0x10.0	4	3 blade - 6.0mm standoff	
PT-2130FP	Self Drive	3.0	80	1.5-30	24.0x9.5	1	3 pin	P2 (9mm), P3 (4mm)
PT-2726FP	Self Drive	2.6	90	3-28	30.0x10.0	1	3 pin	P2 (9mm), P3 (5mm)
» PT-2732FP	Self Drive	3.2	88	3-28	28.5x30.0	12	3 pin	
PT-2736FP	Self Drive	3.5	90	3-28	30.0x10.0	1	3 pin	P2 (9mm), P3 (5mm)
PT-2742FP	Self Drive	4.2	90	3-28	30.0x10.0	1	3 pin	P2 (9mm), P3 (5mm)
PT-2728FP	Self Drive	2.8	85	3-28	30.5x33.25x8.3	5	3 blade	
PT-3529FP	Self Drive	2.9	90	3-28	42.0x16.0	1	3 pin	P2 (10.5mm), P3 (8mm)
» PT-3534FP	Self Drive	3.4	105	4.5-18	39.9x20.0	1	3 pin	P2 (10.5mm), P3 (8mm)
PT-2038FW	Self Drive	3.8	85	3-28	24.0x5.0	2	Flange Mount (29.0 c/c) - 3 wire	
PT-2060FW	Self Drive	6.0	85	3-28	24.0x5.0	2	Flange Mount (29.0 c/c) - 3 wire	
PT-2065FW	Self Drive	6.5	85	3-28	24.0x5.0	2	Flange Mount (29.0 c/c) - 3 wire	
PT-2130FW	Self Drive	3.0	80	3-28	24.0x9.5	2	Flange Mount (29.0 c/c) - 3 wire	
PT-2745FW	Self Drive	4.5	85	3-28	30.0x5.5	2	Flange Mount (35.0 c/c) - 3 wire	
PT-2726FW	Self Drive	2.6	90	3-28	30.0x10.0	2	Flange Mount (39.0 c/c) - 3 wire	
PT-2736FW	Self Drive	3.5	90	3-28	30.0x10.0	2	Flange Mount (39.0 c/c) - 3 wire	
PT-2742FW	Self Drive	4.2	90	3-28	30.0x10.	2	Flange Mount (39.0 c/c) - 3 wire	
PT-2746FW	Self Drive	4.5	85	3-28	30.0x5.5	1	3 wire	
PT-3529FW	Self Drive	2.9	90	3-28	42.0x16.0	2	Flange Mount (50.0 c/c) - 3 wire	

Miniature Speaker (Cone Type)

Catalog Number	Type	Resonant Frequency (kHz ± 200)	dB (Min) @ 1.0 kHz 10cm, 1 V sine wave	Maximum Input (Watt)	D x H	Figure	Mounting & Features	Pitch
PB-2015P	Miniature Speaker - Cone Type	1500	75	0.15	23.0x8.2	1	P.C Board - 2 pin	(10.0mm c/c)
PB-2015W	Miniature Speaker - Cone Type	1500	75	0.15	23.0x8.2	2	Flange Mount - 2 wire	
PB-2712P	Miniature Speaker - Cone Type	1250	85	0.2	30.0x13.0	1	P.C Board - 2 pin	(15.0mm c/c)
PB-2712W	Miniature Speaker - Cone Type	1250	85	0.2	30.0x13.0	2	Flange Mount - 2 wire	

Mounted Piezo Transducers

(•Indicates part is sealed)

Electro-Magnetic Transducers

Catalog Number	Type	Resonant Frequency (Hz)	dB (Min) @ Res. Freq. 10cm	Operating Voltage	D x H	Figure	Mounting & Features	Pitch
PB-0927P	Electro-Magnetic Transducer	2731	85 @ 5.0V	5	5.5x9.0	1	2 pin	(4.0mm c/c)
PB-1220P	Electro-Magnetic Transducer	2048	85 @ 1.5V	1.1 ~ 1.7	12.0x8.5	1	2 pin	(6.5mm c/c)
PB-1220W	Electro-Magnetic Transducer	2048	85 @ 1.5V	1.1 ~ 1.7	12.0x8.5	1	2 wire	
PB-1221P	Electro-Magnetic Transducer	2048	80 @ 1.5V	1.1 ~ 1.7	12.0x8.5	1	2 pin	(6.5mm c/c)
PB-1221W	Electro-Magnetic Transducer	2048	80 @ 1.5V	1.1 ~ 1.7	12.0x8.5	1	2 wire	
• PB-1220PE	Electro-Magnetic Transducer	2048	85 @ 1.5V	1.1 ~ 1.7	12.0 x 9.6	1	2 pin	(6.5mm c/c)
• PB-1221PE	Electro-Magnetic Transducer	2048	80 @ 1.5V	1.1 ~ 1.7	12.0 x 9.6	1	2 pin	(6.5mm c/c)
• PB-1224P-05	Electro-Magnetic Transducer	2400	85 @ 5.0V	4.0 ~ 8.0	12.0 x 9.5	1	2 pin	(6.5mm c/c)
• PB-1620P	Electro-Magnetic Transducer	2048	80 @ 1.5V	1.1 ~ 3.0	See Figure	9	2 pin	(7.6mm c/c)
• PB-1621P	Electro-Magnetic Transducer	2048	85 @ 5.0V	3.0 ~ 8.0	See Figure	9	2 pin	(7.6mm c/c)
• PB-1622P	Electro-Magnetic Transducer	2048	85 @ 12V	6.0 ~ 18	See Figure	9	2 pin	(7.6mm c/c)

» Denotes NEW Models

Telephone Ringers

Catalog Number	Resonant Frequency (kHz ±0.5)	dB (Min) @ Res. Freq. 10cm, 5v square wave	Operating Voltage (Max Vp-p)	D x H	Figure	Mounting	Pitch
PT-3110P	1.1	85	40	34.5x9.0	1	2 pin	(25.4 mm c/c)
PT-3110W	1.1	85	40	34.5x9.0	2	Flange Mount 2 wire (40mm c/c)	
PT-4175P	0.75	87	40	44.0x14.0	1	2 pin	(25.4 mm c/c)
PT-4175W	0.75	87	40	See Figure	10	Flange Mount 2 wire (52mm c/c)	
PT-2030P	2.0	80	25	See Figure	6	2 pin	
PT-4176P	0.75	87	40	See Figure	11	2 pin	

Introduction to Piezo Indicators

NEW

MALLORY

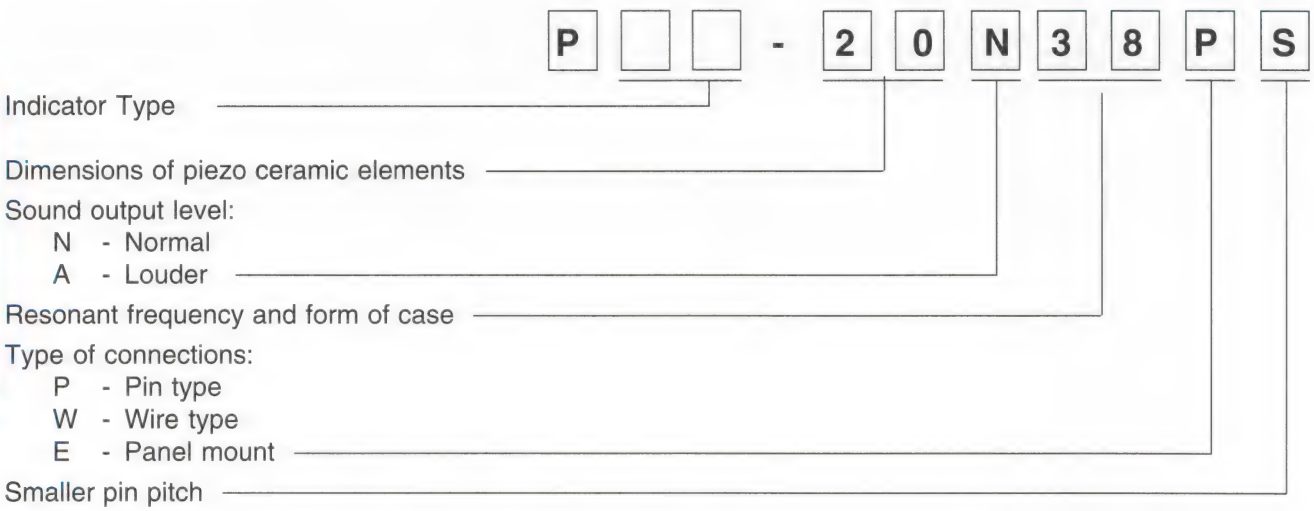
Features

- Low current consumption and high sound output
- Extremely clear and penetrating sound
- Small size and light weight
- No electronic generated EMI or RFI

Applications

- Office equipment
- Communication equipment
- Home appliances
- Alarms
- Computers
- Vehicles

Part Numbering



Indicators have internal drive circuitry built in and require only DC source voltage for operation.

Piezo Indicators

NEW

MALLORY

(•Indicates part is sealed)

	Catalog Number	Tone	Operating Voltage (VDC)	Oscillating Frequency ±0.5%	dB (Minimum) @ 12VDC	D x H	Figure	Mounting & Features	Pitch
	PK-27N25W	C	3 ~ 28	2.5	90 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PK-27N26W	C	3 ~ 28	2.5	90 @ 30cm	30.0x10.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PK-27A25W	C	3 ~ 20	2.5	95 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PK-20A25W	C	3 ~ 20	2.5	95 @ 30cm	23.4x18.0	2	Flange Mount (29.0 c/c) - 2 wire	
	PK-35N29W	C	3 ~ 28	2.9	90 @ 30cm	42.0x16.0	2	Flange Mount (50.0 c/c) - 2 wire	
	PK-35A29W	C	3 ~ 20	2.9	95 @ 30cm	42.0x16.0	2	Flange Mount (50.0 c/c) - 2 wire	
	PK-21N30W	C	1.5 ~ 30	3.0	80 @ 30cm	24.0x9.5	2	Flange Mount (29.0 c/c) - 2 wire	
	PK-21A29W	C	3 ~ 24	3.0	90 @ 30cm	24.0x13.5	2	Flange Mount (29.0 c/c) - 2 wire	
	PK-27N36W	C	3 ~ 28	3.5	90 @ 30cm	30.0x10.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PK-27N35W	C	3 ~ 28	3.5	90 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PK-27A35W	C	3 ~ 20	3.5	95 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PK-20N38W	C	3 ~ 28	3.8	85 @ 30cm	23.4x18.0	2	Flange Mount (29.0 c/c) - 2 wire	
	PK-20A38W	C	3 ~ 20	3.8	95 @ 30cm	23.4x18.0	2	Flange Mount (29.0 c/c) - 2 wire	
•	PK-27N35EP	C	3 ~ 28	3.5	90 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PK-27N35ER	C	3 ~ 28	3.5	90 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PK-27A35EP	C	3 ~ 24	3.5	95 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PK-27A35ER	C	3 ~ 24	3.5	95 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
	PK-20A35EW	C	3 ~ 28	3.5	95 @ 30cm	See Figure	7	Panel or Flange Mount - 2 wire	
	PK-27N26PS	C	3 ~ 28	2.5	90 @ 30cm	30.0x10.0	1	P.C. Board - 2 pin	P1 15mm
	PK-27N25PS	C	3 ~ 28	2.5	90 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
	PK-20A25P	C	3 ~ 20	2.5	95 @ 30cm	23.4x18.0	1	P.C. Board - 2 pin	P1 15mm
	PK-27A25PS	C	3 ~ 20	2.5	95 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
	PK-21N30P	C	1.5 ~ 30	3.0	80 @ 30cm	24.0x9.5	1	P.C. Board - 2 pin	P1 15mm
	PK-21A29P	C	3 ~ 24	3.0	90 @ 30cm	24.0x13.5	1	P.C. Board - 2 pin	P1 15mm
•	PK-21N31P	C	1.5 ~ 30	3.5	80 @ 30cm	24.0x13.5	1	P.C. Board - 2 pin	P1 15mm
•	PK-21A31P	C	3 ~ 24	3.5	90 @ 30cm	24.0x13.5	1	P.C. Board - 2 pin	P1 15mm
	PK-27N36PS	C	3 ~ 28	3.5	90 @ 30cm	30.0x10.0	1	P.C. Board - 2 pin	P1 15mm
	PK-27N35PS	C	3 ~ 28	3.5	90 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
	PK-27A35PS	C	3 ~ 20	3.5	95 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
	PK-20N38P	C	3 ~ 20	3.8	85 @ 30cm	23.4x18.0	1	P.C. Board - 2 pin	P1 15mm
	PK-20A38P	C	3 ~ 20	3.8	95 @ 30cm	23.4x18.0	1	P.C. Board - 2 pin	P1 15mm
	PK-12N40P	C	3 ~ 15	4.1	83 @ 10cm	13.8x7.5	1	P.C. Board - 2 pin	P1 7.6mm
	PFD-35N29W	C/FP	3 ~ 28	2.9	90 @ 30cm	42.0x16.0	2	Flange Mount (50.0 c/c) - 3 wire	
	PFD-35A29W	C/FP	3 ~ 20	2.9	95 @ 30cm	42.0x16.0	2	Flange Mount (50.0 c/c) - 3 wire	
	PFD-21N30W	C/FP	4 ~ 28	3.0	80 @ 30cm	24.0x9.5	2	Flange Mount (29.0 c/c) - 3 wire	
	PFD-21A29W	C/FP	3 ~ 24	3.0	90 @ 30cm	24.0x13.5	2	Flange Mount (29.0 c/c) - 3 wire	
	PFD-27N36W	C/FP	3 ~ 28	3.5	90 @ 30cm	30.0x10.0	2	Flange Mount (39.0 c/c) - 3 wire	
	PFD-27N35W	C/FP	3 ~ 28	3.5	90 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 3 wire	
	PFD-27A35W	C/FP	3 ~ 20	3.5	95 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 3 wire	
•	PFD-27N35EP	C/FP	3 ~ 28	3.5	90 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PFD-27N35ER	C/FP	3 ~ 28	3.5	90 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PFD-27A35ER	C/FP	3 ~ 24	3.5	95 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PFD-27A35EP	C/FP	3 ~ 24	3.5	95 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
	PFD-20A35EW	C/FP	3 ~ 28	3.5	95 @ 30cm	See Figure	7	Panel or Flange Mount - 3 wire	
	PFD-21N30P	C/FP	4 ~ 28	3.0	80 @ 30cm	24.0x9.5	1	P.C. Board - 3 pin	P2 7.5mm, P3 7.5mm
	PFD-27N35P	C/FP	3 ~ 28	3.5	90 @ 30cm	30.0x16.0	1	P.C. Board - 3 pin	P2 7mm, P3 11mm
	PFD-27N36P	C/FP	3 ~ 28	3.5	90 @ 30cm	30.0x10.0	1	P.C. Board - 3 pin	P2 7mm, P3 11mm
	PFD-27A35P	C/FP	3 ~ 20	3.5	95 @ 30cm	30.0x16.0	1	P.C. Board - 3 pin	P2 7mm, P3 11mm
	PLD-35N29W	C/SP	3 ~ 28	2.9	90 @ 30cm	42.0x16.0	2	Flange Mount (50.0 c/c) - 3 wire	
	PLD-35A29W	C/SP	3 ~ 20	2.9	95 @ 30cm	42.0x16.0	2	Flange Mount (50.0 c/c) - 3 wire	
	PLD-21N30W	C/SP	4 ~ 28	3.0	80 @ 30cm	24.0x9.5	2	Flange Mount (29.0 c/c) - 3 wire	
	PLD-21A29W	C/SP	3 ~ 24	3.0	90 @ 30cm	24.0x13.5	2	Flange Mount (39.0 c/c) - 3 wire	
	PLD-27N36W	C/SP	3 ~ 28	3.5	90 @ 30cm	30.0x10.0	2	Flange Mount (39.0 c/c) - 3 wire	
	PLD-27N35W	C/SP	3 ~ 28	3.5	90 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 3 wire	
	PLD-27A35W	C/SP	3 ~ 20	3.5	95 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 3 wire	
•	PLD-27N35ER	C/SP	3 ~ 28	3.5	90 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PLD-27N35EP	C/SP	3 ~ 28	3.5	90 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PLD-27A35EP	C/SP	3 ~ 24	3.5	95 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PLD-27A35ER	C/SP	3 ~ 24	3.5	95 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
	PLD-20A35EW	C/SP	3 ~ 28	3.5	95 @ 30cm	See Figure	7	Panel or Flange Mount - 3 wire	
	PLD-21N30P	C/SP	4 ~ 28	3.0	80 @ 30cm	24.0x9.5	1	P.C. Board - 3 pin	P2 7.5mm, P3 7.5mm
	PLD-27N36P	C/SP	3 ~ 28	3.5	90 @ 30cm	30.0x10.0	1	P.C. Board - 3 pin	P2 7mm, P3 11mm
	PLD-27N35P	C/SP	3 ~ 28	3.5	90 @ 30cm	30.0x16.0	1	P.C. Board - 3 pin	P2 7mm, P3 11mm
	PLD-27A35P	C/SP	3 ~ 20	3.5	95 @ 30cm	30.0x16.0	1	P.C. Board - 3 pin	P2 7mm, P3 11mm
	PF-27N25W	FP	3 ~ 28	2.5	90 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PF-27N26W	FP	3 ~ 28	2.5	90 @ 30cm	30.0x10.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PF-27A25W	FP	3 ~ 20	2.5	95 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PF-35N29W	FP	3 ~ 28	2.9	90 @ 30cm	42.0x16.0	2	Flange Mount (50.0 c/c) - 2 wire	
	PF-35A29W	FP	3 ~ 20	2.9	95 @ 30cm	42.0x16.0	2	Flange Mount (50.0 c/c) - 2 wire	

"C" = Constant, "FP" = Fast Pulse, "SP" = Slow Pulse

Piezo Indicators

NEW

MALLORY

(•Indicates part is sealed)

	Catalog Number	Tone	Operating Voltage (VDC)	Oscillating Frequency ±0.5%	dB (Minimum) @ 12VDC	D x H	Figure	Mounting & Features	Pitch
	PF-21N30W	FP	4 ~ 28	3.0	80 @ 30cm	24.0x9.5	2	Flange Mount (29.0 c/c) - 2 wire	
	PF-21A29W	FP	3 ~ 24	3.0	90 @ 30cm	24.0x13.5	2	Flange Mount (29.0 c/c) - 2 wire	
	PF-27N36W	FP	3 ~ 28	3.5	90 @ 30cm	30.0x10.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PF-27N35W	FP	3 ~ 28	3.5	90 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PF-27A35W	FP	3 ~ 20	3.5	95 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
•	PF-27N35EP	FP	6 ~ 28	3.5	90 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PF-27N35ER	FP	6 ~ 28	3.5	90 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PF-27A35ER	FP	6 ~ 24	3.5	95 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PF-27A35EP	FP	6 ~ 24	3.5	95 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
	PF-20A35EW	FP	3 ~ 28	3.5	95 @ 30cm	See Figure	7	Panel or Flange Mount - 2 wire	
	PF-27N25PS	FP	3 ~ 28	2.5	90 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
	PF-27N26PS	FP	3 ~ 28	2.5	90 @ 30cm	30.0x10.0	1	P.C. Board - 2 pin	P1 15mm
	PF-27A25PS	FP	3 ~ 20	2.5	95 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
•	PF-21N31P	FP	1.5 ~ 30	3.0	80 @ 30cm	24.0x13.5	1	P.C. Board - 2 pin	P1 15mm
	PF-21N30P	FP	4 ~ 28	3.0	80 @ 30cm	24.0x9.5	1	P.C. Board - 2 pin	P1 15mm
	PF-21A29P	FP	3 ~ 24	3.0	90 @ 30cm	24.0x13.5	1	P.C. Board - 2 pin	P1 15mm
•	PF-21A31P	FP	3 ~ 24	3.0	90 @ 30cm	24.0x13.5	1	P.C. Board - 2 pin	P1 15mm
	PF-27N36PS	FP	3 ~ 28	3.5	90 @ 30cm	30.0x10.0	1	P.C. Board - 2 pin	P1 15mm
	PF-27N35PS	FP	3 ~ 28	3.5	90 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
	PF-27A35PS	FP	3 ~ 20	3.5	95 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
	PL-27N26W	SP	3 ~ 28	2.5	90 @ 30cm	30.0x10.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PL-27N25W	SP	3 ~ 28	2.5	90 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PL-27A25W	SP	3 ~ 20	2.5	95 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PL-35N29W	SP	3 ~ 28	2.9	90 @ 30cm	42.0x16.0	2	Flange Mount (50.0 c/c) - 2 wire	
	PL-35A29W	SP	3 ~ 20	2.9	95 @ 30cm	42.0x16.0	2	Flange Mount (50.0 c/c) - 2 wire	
	PL-21N30W	SP	4 ~ 28	3.0	80 @ 30cm	24.0x9.5	2	Flange Mount (29.0 c/c) - 2 wire	
	PL-21A29W	SP	3 ~ 24	3.0	90 @ 30cm	24.0x13.5	2	Flange Mount (29.0 c/c) - 2 wire	
	PL-27N36W	SP	3 ~ 28	3.5	90 @ 30cm	30.0x10.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PL-27N35W	SP	3 ~ 28	3.5	90 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
	PL-27A35W	SP	3 ~ 20	3.5	95 @ 30cm	30.0x16.0	2	Flange Mount (39.0 c/c) - 2 wire	
•	PL-27N35ER	SP	6 ~ 28	3.5	90 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PL-27N35EP	SP	6 ~ 28	3.5	90 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PL-27A35ER	SP	6 ~ 24	3.5	95 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
•	PL-27A35EP	SP	6 ~ 24	3.5	95 @ 30cm	See Figure	8	Panel Mount - Tamper Proof	
	PL-20A35EW	SP	3 ~ 28	3.5	95 @ 30cm	See Figure	7	Panel or Flange Mount - 2 wire	
	PL-27N26PS	SP	3 ~ 28	2.5	90 @ 30cm	30.0x10.0	1	P.C. Board - 2 pin	P1 15mm
	PL-27N25PS	SP	3 ~ 28	2.5	90 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
	PL-27A25PS	SP	3 ~ 20	2.5	95 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
•	PL-21N31P	SP	1.5 ~ 30	3.0	80 @ 30cm	24.0x13.5	1	P.C. Board - 2 pin	P1 15mm
	PL-21N30P	SP	4 ~ 28	3.0	80 @ 30cm	24.0x9.5	1	P.C. Board - 2 pin	P1 15mm
•	PL-21A31P	SP	3 ~ 24	3.0	90 @ 30cm	24.0x13.5	1	P.C. Board - 2 pin-(sealed back)	P1 15mm
	PL-21A29P	SP	3 ~ 24	3.0	90 @ 30cm	24.0x13.5	1	P.C. Board - 2 pin	P1 15mm
	PL-27N36PS	SP	3 ~ 28	3.5	90 @ 30cm	30.0x10.0	1	P.C. Board - 2 pin	P1 15mm
	PL-27N35PS	SP	3 ~ 28	3.5	90 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm
	PL-27A35PS	SP	3 ~ 20	3.5	95 @ 30cm	30.0x16.0	1	P.C. Board - 2 pin	P1 15mm

Electro-Magnetic Indicators

	Catalog Number	Tone	Operating Voltage (VDC)	Oscillating Frequency	dB (Minimum) @ Res. Freq.	D x H	Figure	Mounting & Features	Pitch
•	PB-12N23P-01	C	1.25 ~ 2.0	2,300±200	80 @ 10cm	12.0x9.5	1	2 pin - Sealed	P1 7.6mm
•	PB-12N23P-03	C	2.5 ~ 4.0	2,300±200	85 @ 10cm	12.0x9.5	1	2 pin - Sealed	P1 7.6mm
•	PB-12N23P-05	C	4.0 ~ 6.5	2,300±200	85 @ 10cm	12.0x9.5	1	2 pin - Sealed	P1 7.6mm
•	PB-12N23P-12	C	10 ~ 14	2,300±200	85 @ 10cm	12.0x9.5	1	2 pin - Sealed	P1 7.6mm
	PK-16N04W-03	C	2.0 ~ 4.0	400±100	82 @30cm	See Figure	13	Electric Solid State Buzzer	
	PK-16N04W-06	C	4.0 ~ 8.0	400±100	85 @ 30cm	See Figure	13	Electric Solid State Buzzer	
	PK-16N04W-12	C	8.0 ~ 16.0	400±100	85 @ 30cm	See Figure	13	Electric Solid State Buzzer	
	PK-16N04W-24	C	20. 0 ~ 28.0	400±100	85 @ 30cm	See Figure	13	Electric Solid State Buzzer	

"C" = Constant, "FP" = Fast Pulse, "SP" = Slow Pulse

Piezo Sirens

NEW

(•Indicates part is sealed)

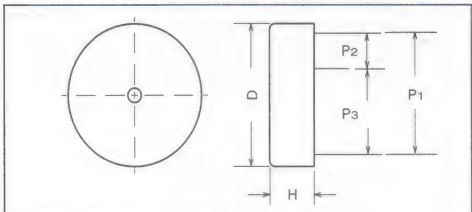
MALLORY

	Catalog Number	Tone	Sweep (Pulse) Rate @ 12VDC (Hz ± 20%)	Operating Voltage (Rated 12VDC)	Operating Frequency (kHz)	dB @100cm 12V(min)	Figure	Description
	PS-580	Constant	-	6 ~ 14	2.8 ± 0.5	100	19	Piezo Siren
	PS-510	Constant	-	6 ~ 15	3.0 ± 0.5	110	14	Piezo Siren
	PS-500	Constant	-	6 ~ 15	3.0 ± 0.5	110	22	Piezo Siren
	PS-570	Constant	-	7 ~ 15	3.0 ± 0.5	108	24	Piezo Siren
•	PS-530	Constant	-	7 ~ 15	2.8 ± 0.5	105	16	Piezo Siren
•	PS-550	Constant	-	7 ~ 15	2.8 ± 0.5	105	17	Piezo Siren
	PS-520	Constant	-	7 ~ 15	3.0 ± 0.5	105	15	Piezo Siren
	PS-502	Hi-Lo	1.2	6 ~ 15	2.5 / 3.5	110	22	Piezo Siren
	PS-512	Hi-Lo	1.2	6 ~ 15	2.5 / 3.5	110	14	Piezo Siren
	PS-562	Hi-Lo	1.2	7 ~ 15	2.5 / 3.5	100	18	Piezo Siren
•	PS-552	Hi-Lo	1.2	7 ~ 15	2.5 / 3.5	105	17	Piezo Siren
	PS-522	Hi-Lo	1.2	7 ~ 15	2.5 / 3.5	105	15	Piezo Siren
•	PS-532	Hi-Lo	1.2	7 ~ 15	2.5 / 3.5	105	16	Piezo Siren
	PS-572	Hi-Lo	1.2	7 ~ 15	2.5 / 3.5	108	24	Piezo Siren
	PS-501	Pulse	1.2	6 ~ 15	3.0 ± 0.5	110	22	Piezo Siren
	PS-511	Pulse	1.2	6 ~ 15	3.0 ± 0.5	110	14	Piezo Siren
	PS-571	Pulse	1.2	7 ~ 15	3.0 ± 0.5	108	24	Piezo Siren
•	PS-531	Pulse	1.2	7 ~ 15	2.8 ± 0.5	105	16	Piezo Siren
•	PS-551	Pulse	1.2	7 ~ 15	2.8 ± 0.5	105	17	Piezo Siren
	PS-521	Pulse	1.2	7 ~ 15	3.0 ± 0.5	105	15	Piezo Siren
	PS-393	Sweep	3.5	5 ~ 16	1.5 - 3.5	108	23	Piezo Siren
	PS-593	Sweep	3.5	5 ~ 16	1.5 - 3.5	115	20	Piezo Siren
	PS-593L	Sweep	3.5	5 ~ 16	1.5 - 3.5	115	21	Piezo Siren
	PS-983	Sweep	4.5	6 ~ 14	2.0 - 3.5	105	30	Piezo Siren
	PS-583	Sweep	3.3	6 ~ 14	1.5 - 3.5	100	19	Piezo Siren
	PS-953	Sweep	4.5	6 ~ 14	2.0 - 3.5	105	29	Piezo Siren
	PS-723	Sweep	4.5	6 ~ 14	2.0 - 3.5	105	28	Piezo Siren
	PS-713	Sweep	4.5	6 ~ 14	2.0 - 3.5	105	27	Piezo Siren
	PS-513	Sweep	3.3	6 ~ 15	1.5 - 3.5	110	14	Piezo Siren
	PS-503	Sweep	3.3	6 ~ 15	1.5 - 3.5	110	22	Piezo Siren
	PS-523A	Sweep	4.5	7 ~ 15	1.5 - 3.5	105	15	Piezo Siren
•	PS-533	Sweep	3.3	7 ~ 15	1.5 - 3.5	105	16	Piezo Siren
•	PS-553	Sweep	3.3	7 ~ 15	1.5 - 3.5	105	17	Piezo Siren
	PS-573	Sweep	4.5	7 ~ 15	1.5 - 3.5	108	24	Piezo Siren
	PS-903	Sweep + Red Light	4.5	11 ~ 14	1.5 - 3.5	105	25	Intruder Alarm with Strobe
	PS-913	Sweep + Red Light	4.5	11 ~ 14	1.5 - 3.5	105	26	Intruder Alarm with Strobe

Transducer & Indicator Figures

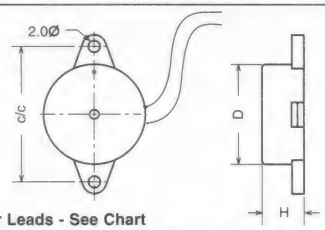
NEW

MALLORY



Pins or Leads - See Chart
Note: Outlines may vary from those depicted, and case may include standoffs. Contact NACC for specifics

Fig. 1



Pins or Leads - See Chart
Note: Outlines may vary from those depicted, and case may include standoffs. Contact NACC for specifics

Fig. 2

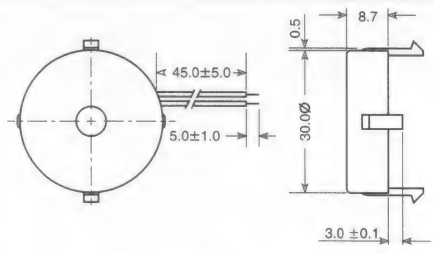


Fig. 3

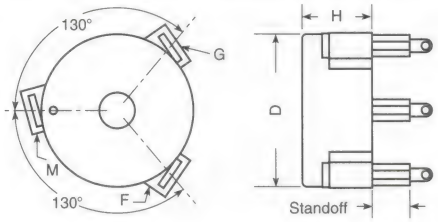


Fig. 4

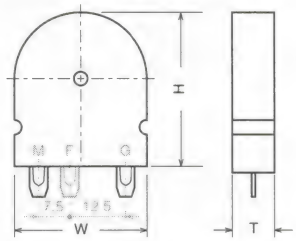


Fig. 5

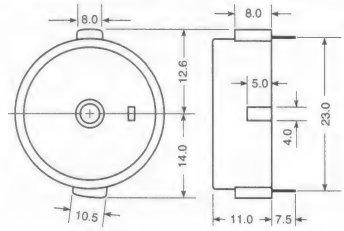


Fig. 6

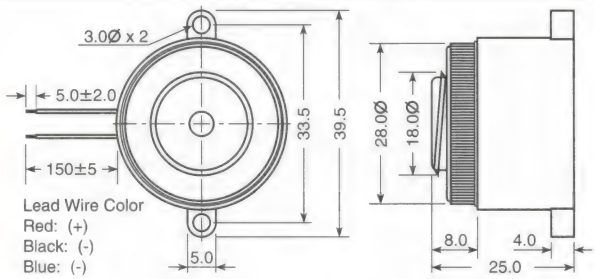


Fig. 7

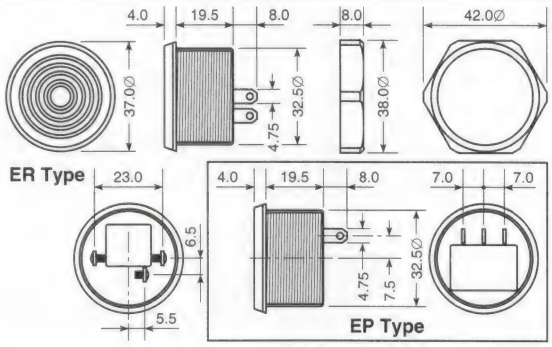


Fig. 8

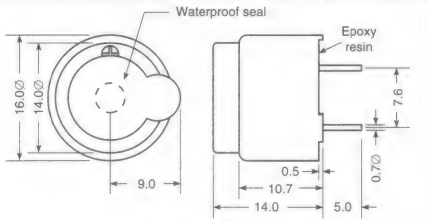


Fig. 9

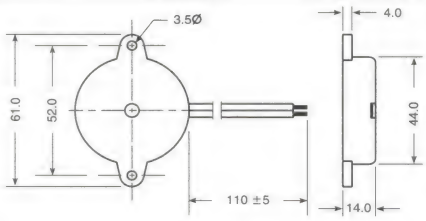


Fig. 10

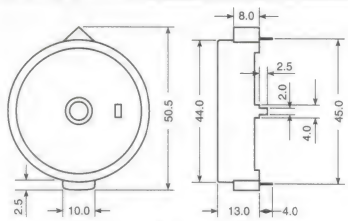


Fig. 11

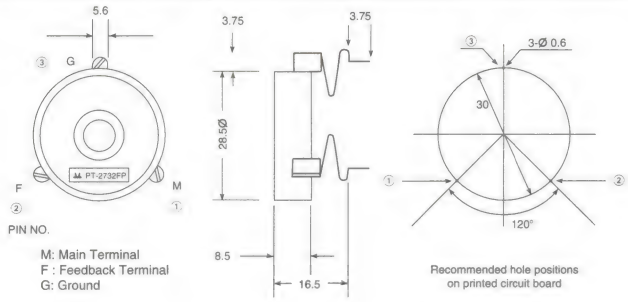


Fig. 12

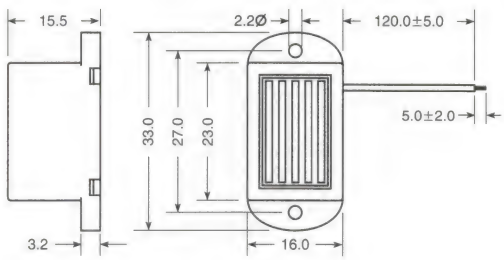


Fig. 13

All dimensions are in millimeters

Piezo Siren Figures

NEW

MALLORY

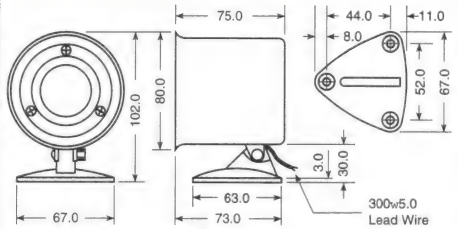


Fig. 14

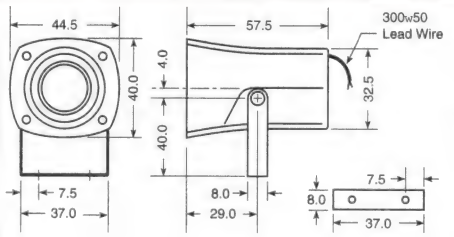


Fig. 15

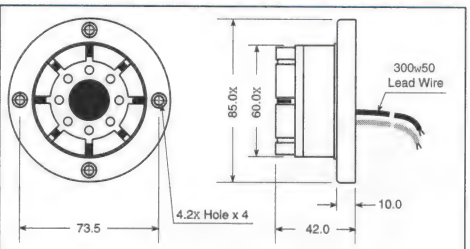


Fig. 16

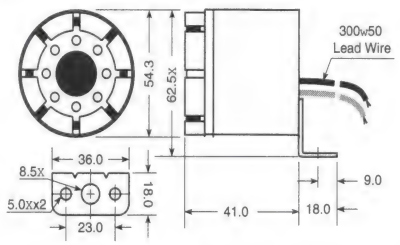


Fig. 17

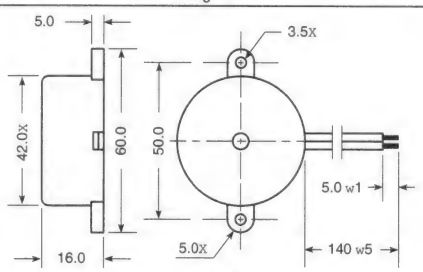


Fig. 18

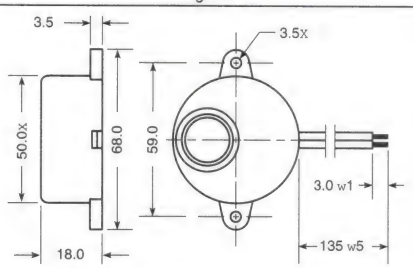


Fig. 19

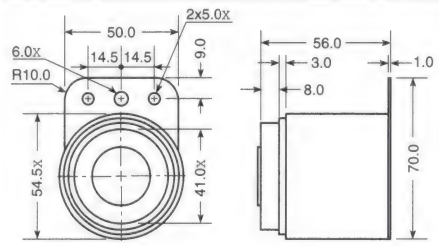


Fig.20

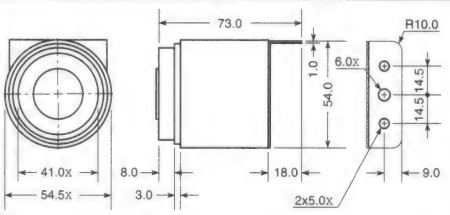


Fig. 21

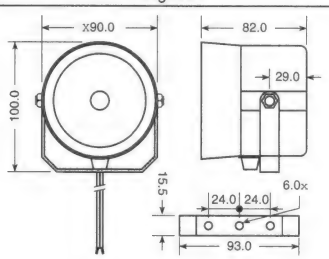


Fig. 22

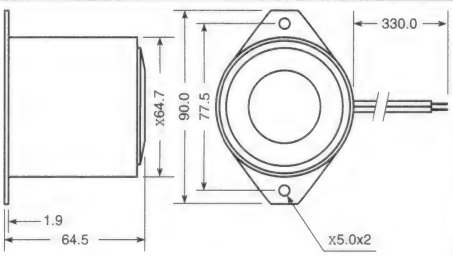


Fig. 23

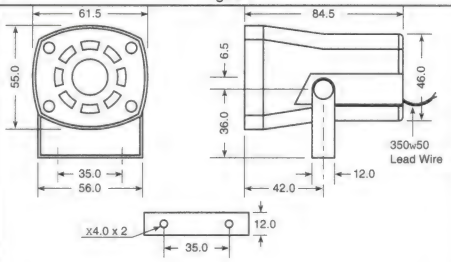


Fig. 24

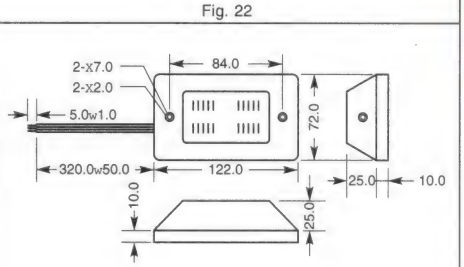


Fig. 25

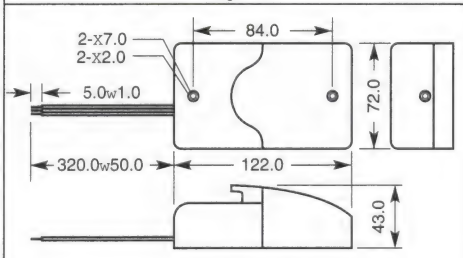


Fig. 26

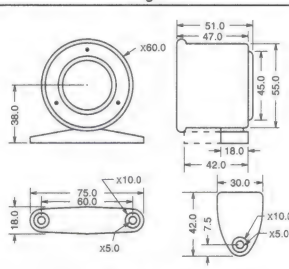


Fig. 27

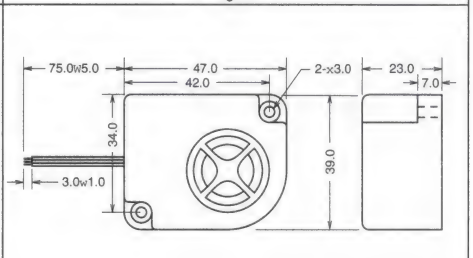


Fig. 28

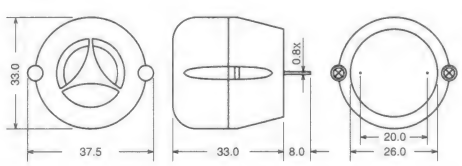


Fig. 29

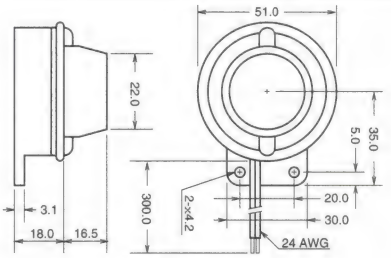


Fig. 30

All dimensions are in millimeters

Sound Devices

Type FP
DC Voltage Rotary Fans

MALLORY

- Solid state brushless DC motors
- Low current, low noise and low interference
- Ball or sleeve bearings available
- CPU cooling module available for the 40mm fan

GENERAL SPECIFICATIONS

Operating Temperature:
-10°C +70°C (Sleeve Bearing)
-20°C +80°C (Ball Bearing)

Storage Temperature:
-40°C +75°C
@ 65% Relative Humidity

Operating Voltage:
Rated Voltage + 15%

Insulation Resistance:
10MΩ min. @ 500VDC between frame and positive terminal

Dielectric Strength:
1 mA max @ 500VDC

Rotation: Clockwise

Wire Material:
Red (+) UL1007, AWG24
Black (-) UL1007, AWG24

Expected Life:

Ball	Sleeve	Temp
100,000 hrs.	60,000 hrs.	25°C
50,000 hrs.	30,000 hrs.	40°C
30,000 hrs.	20,000 hrs.	55°C
15,000 hrs.	10,000 hrs.	70°C

Plastic Material:
Impeller - Injection molded non-flammable black Thermoplastic UL 94V-0 rating.
Frame - Injection molded non-flammable black Thermoplastic UL 94V-0 rating.
Ball Bearing - Precision, life lubricated ball bearing system.
Sleeve Bearing - Precision, oil impregnated sintered sleeve bearing system.

International Approvals

Safety Agency	File Number
CSA	LR701137 LR701318
UL	E89467
TUV (CE)	P9664035F.01

Part Number Nonmenclature

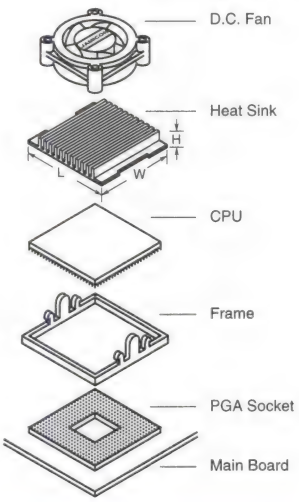
FP108 HX DC12V S1 B
(1) (*2) (3) (4) (5)

1. Series
2. Dimension Code
3. DC Voltage Rating
4. RPM (See Catalog Number list)
5. Shaft (BLANK = Sleeve, B = Ball)

* One or two letter code, depending on type.

Cooling Module Assembly Chart

Heat sink and power supply connector are optional on models CIC4865 and CICP620



CIC4865
L: 44.5mm Max.
W: 44.5mm Max.
H: 5.0mm Max.

CICP620
L: 67.5mm Max.
W: 67.5mm Max.
H: 20.0mm Max.

New Catalog Number	Fan Outline Dimensions (Millimeters) W	L	T	P	I	Rated Voltage (VDC)	Rated Current (A)	Input Power (W)	Air Flow (CFM)	Static Pressure (inches-H2O)	Volume (M^3/Min.)	Noise Level (dB)	Rotary Speed RPM ±10%	Approx. Weight (g)
FP108IDC05VS1*	25	25	10	20	145	5	0.12	0.6	1.95	0.19	0.06	30	10000	8
FP108IDC12VS1*	25	25	10	20	145	12	0.06	0.72	1.95	0.19	0.06	30	10000	8
FP108IDC05VS2*	25	25	10	20	145	5	0.09	0.45	1.45	0.11	0.04	25	7000	8
FP108IDC12VS2*	25	25	10	20	145	12	0.05	0.6	1.45	0.11	0.04	25	7000	8
FP108HXDC05VS1*	40	40	10.5	32	300	5	0.15	0.75	5.4	0.18	0.16	30	6000	20
FP108HXDC12VS1*	40	40	10.5	32	300	12	0.08	0.96	5.4	0.18	0.16	30	6000	20
FP108HXDC05VS2*	40	40	10.5	32	300	5	0.09	0.45	4	0.16	0.11	25	4500	20
FP108HXDC12VS2*	40	40	10.5	32	300	12	0.06	0.72	4	0.16	0.16	25	4500	20
FP108JDC12VS1*	50	50	12	42	300	12	0.1	1.2	10.5	0.15	0.3	31	5500	25
FP108JDC12VS2*	50	50	12	42	300	12	0.07	0.84	8	0.11	0.25	27	4200	25
FP108FXDC12VS1*	60	60	20	50	300	12	0.15	1.8	18	0.15	0.5	30	4300	75
FP108FXDC24VS1*	60	60	20	50	300	24	0.1	2.4	18	0.15	0.5	30	4300	75
FP108FXDC12VS2*	60	60	20	50	300	12	0.13	1.56	13	0.1	0.37	27	3500	75
FP108FXDC24VS2*	60	60	20	50	300	24	0.08	1.92	13	0.1	0.37	27	3500	75
FP108FDC12VS1*	60	60	25.4	50	300	12	0.13	1.56	20	0.17	0.57	30	4000	90
FP108FDC24VS1*	60	60	25.4	50	300	24	0.12	2.88	20	0.17	0.57	30	4000	90
FP108FDC12VS2*	60	60	25.4	50	300	12	0.11	1.32	15.5	0.14	0.44	25	3200	90
FP108FDC24VS2*	60	60	25.4	50	300	24	0.1	2.4	15.5	0.14	0.44	25	3200	90
FP108FDC12VS3*	60	60	25.4	50	300	12	0.09	1.08	12.7	0.1	0.36	22	2600	90

* Indicate bearing: B = Ball

Note: All fans are manufactured to NACC's specifications and meet all applicable international approvals.

Type FP
DC Voltage Rotary Fans

MALLORY

New Catalog Number	Fan Outline Dimensions (Millimeters) W	L	T	P	I	Rated Voltage (VDC)	Rated Current (A)	Input Power (W)	Air Flow (CFM)	Static Pressure (inches-H2O)	Volume (M^3/Min.)	Noise Level (dB)	Rotary Speed RPM ±10%	Approx. Weight (g)
FP108FDC24VS3*	60	60	25.4	50	300	24	0.08	1.92	12.7	0.1	0.36	22	2600	90
FP108DDC12VS1*	80	80	25.4	71.5	300	12	0.2	2.4	34	0.22	0.97	32	3200	125
FP108DDC24VS1*	80	80	25.4	71.5	300	24	0.13	3.12	34	0.22	0.97	32	3200	125
FP108DDC12VS2*	80	80	25.4	71.5	300	12	0.16	1.92	29	0.15	0.83	27	2600	125
FP108DDC24VS2*	80	80	25.4	71.5	300	24	0.11	2.64	29	0.15	0.83	27	2600	125
FP108DDC12VS3*	80	80	25.4	71.5	300	12	0.12	1.44	22	0.09	0.62	20	2200	125
FP108DDC24VS3*	80	80	25.4	71.5	300	24	0.09	2.16	22	0.09	0.62	20	2200	125
FP108BDC12VS1*	92	92	25.4	82.5	300	12	0.32	3.12	45	0.15	1.27	32	3200	130
FP108BDC24VS1*	92	92	25.4	82.5	300	24	0.18	4.32	45	0.15	1.27	32	3200	130
FP108BDC12VS2*	92	92	25.4	82.5	300	12	0.2	2.4	35	0.14	1	30	2500	130
FP108BDC24VS2*	92	92	25.4	82.5	300	24	0.14	3.36	35	0.14	1	30	2500	130
FP108BDC12VS3*	92	92	25.4	82.5	300	12	0.16	1.92	27	0.08	0.76	27	2200	130
FP108BDC24VS3*	92	92	25.4	82.5	300	24	0.1	2.4	27	0.08	0.76	27	2200	130
FP108MDC12VS1*	120	120	25.4	104.8	300	12	0.38	4.56	80	0.22	2.3	42	3000	190
FP108MDC24VS1*	120	120	25.4	104.8	300	24	0.24	5.76	80	0.22	2.3	42	3000	190
FP108MDC12VS2*	120	120	25.4	104.8	300	12	0.25	3	68	0.18	1.9	35	2500	190
FP108MDC24VS2*	120	120	25.4	104.8	300	24	0.18	4.32	68	0.18	1.9	35	2500	190
FP108MDC12VS3*	120	120	25.4	104.8	300	12	0.14	1.68	54	0.12	1.53	25	2000	190
FP108MDC24VS3*	120	120	25.4	104.8	300	24	0.1	2.4	54	0.12	1.53	25	2000	190

CPU Cooler

New Catalog Number	Fan Outline Dimensions (Millimeters) W	L	T	P	I	Rated Voltage (VDC)	Rated Current (A)	Input Power (W)	Air Flow (CFM)	Static Pressure (inches-H2O)	Volume (M^3/Min.)	Noise Level (dB)	Rotary Speed RPM ±10%	Approx. Weight (g)
+ CIC4865*	40	40	10.5	32	300	12	0.06	0.72	4	0.16	0.16	25	4500	20
• CICP620*	50	50	12	42	300	12	0.1	1.2	10.5	0.15	0.3	31	5500	25

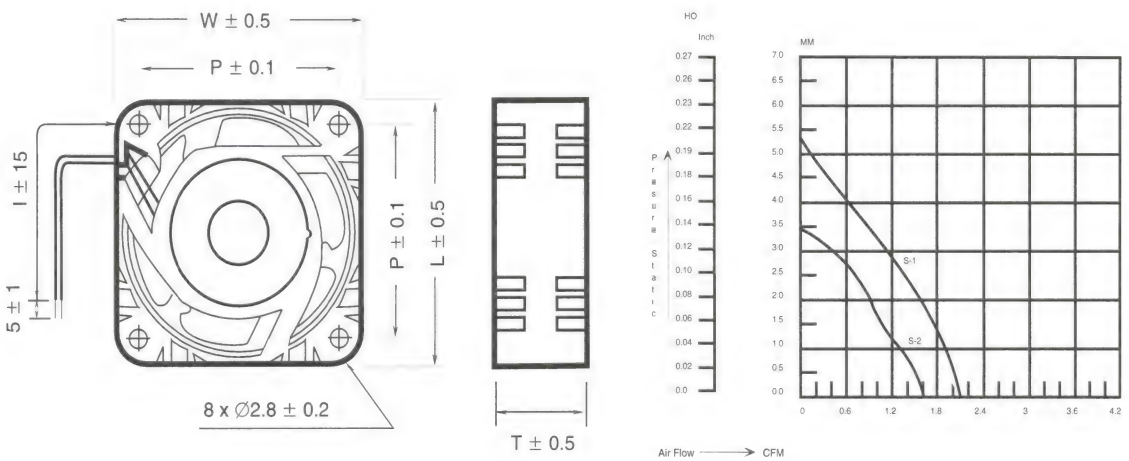
* Indicate bearing: B = Ball
\+ For use with 486 CPU
• For use with Pentium® 166/200 CPU

Heat Sink and connectors to connect CPU cooling module to power supply included with CIC type fans

Measuring Noise

A microphone is placed one meter from the end of the fan with the air flowing outward. It is measured under rated voltage in a semi-anechoic chamber with a sound meter.

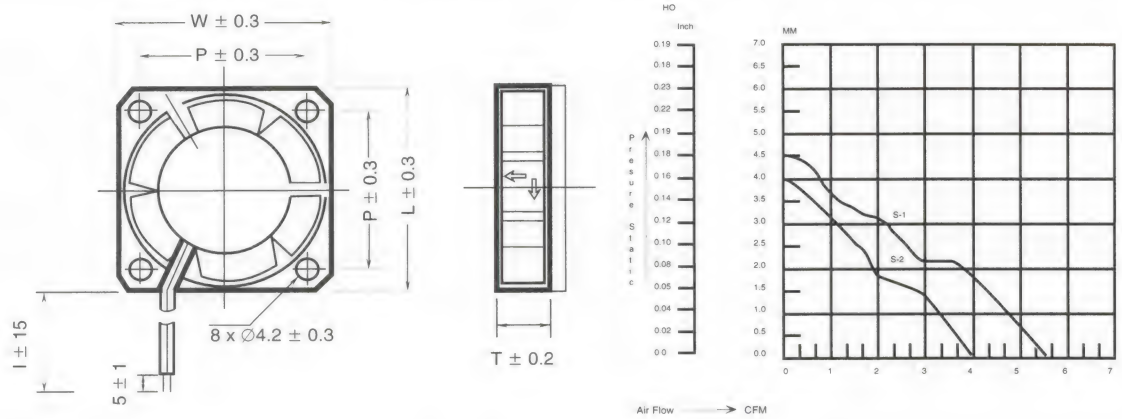
FP108IDC 25x25x10mm



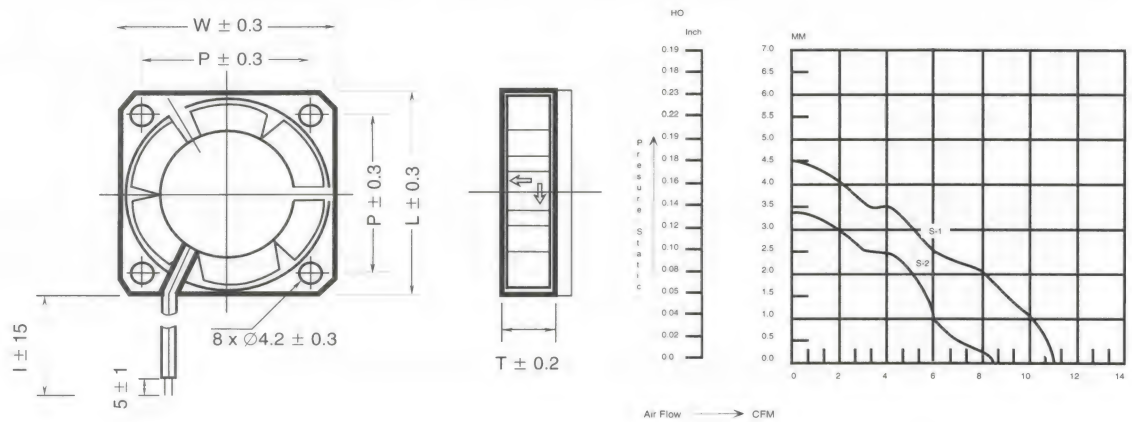
PENTIUM® is a registered trademark of Intel Corp.

Note: All fans are manufactured to NACC's specifications and meet all applicable international approvals.

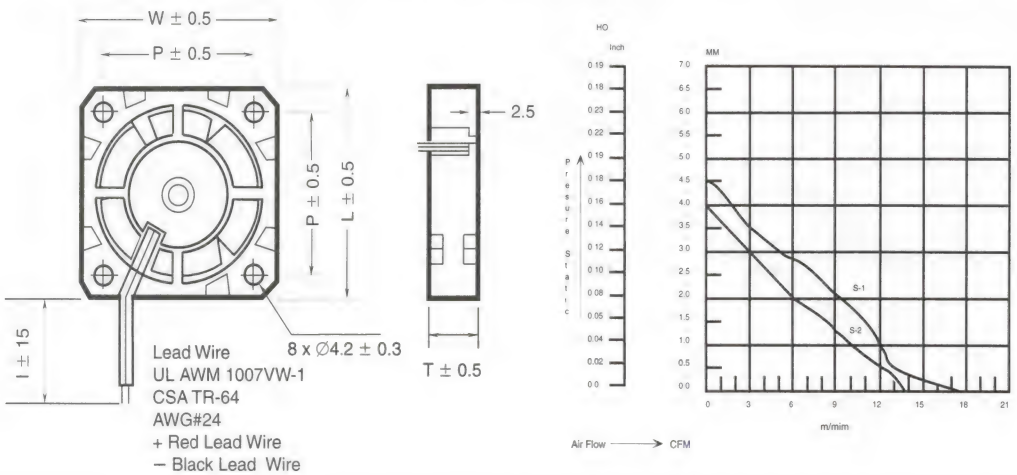
FP108HXDC 40x40x10.5mm



FP108JDC 50x50x12mm

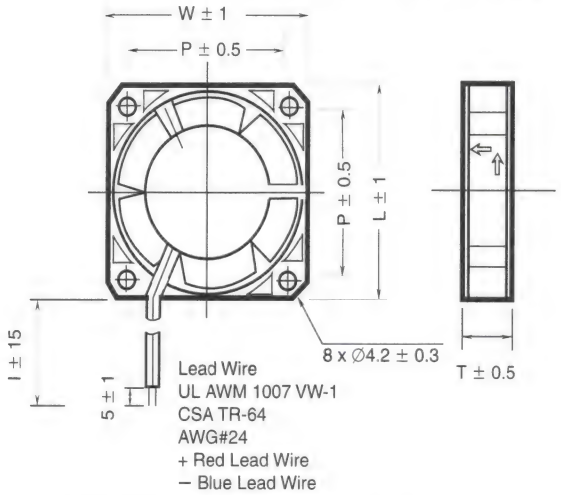


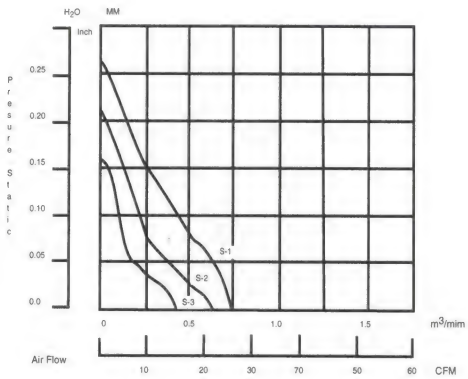
FP108FXDC 60x60x20mm



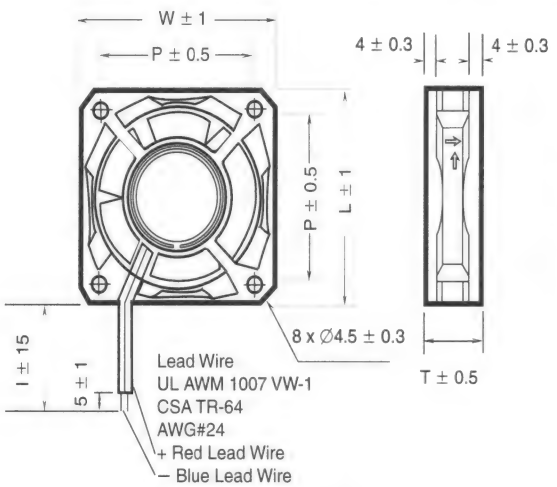
Note: All fans are manufactured to NACC's specifications and meet all applicable international approvals.

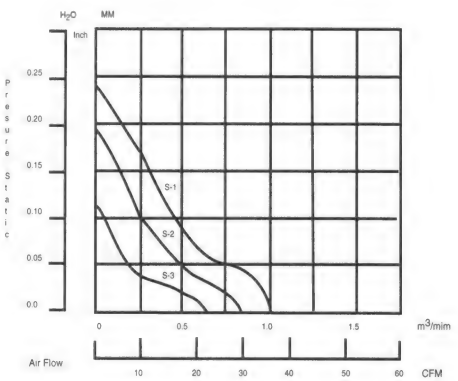
FP108FDC 60x60x25.4mm



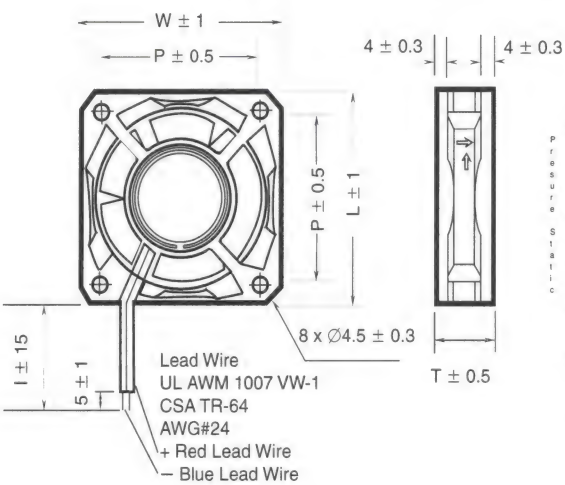


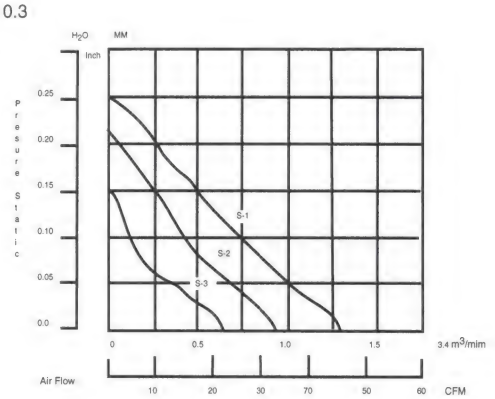
FP108DDC 80x80x25.4mm





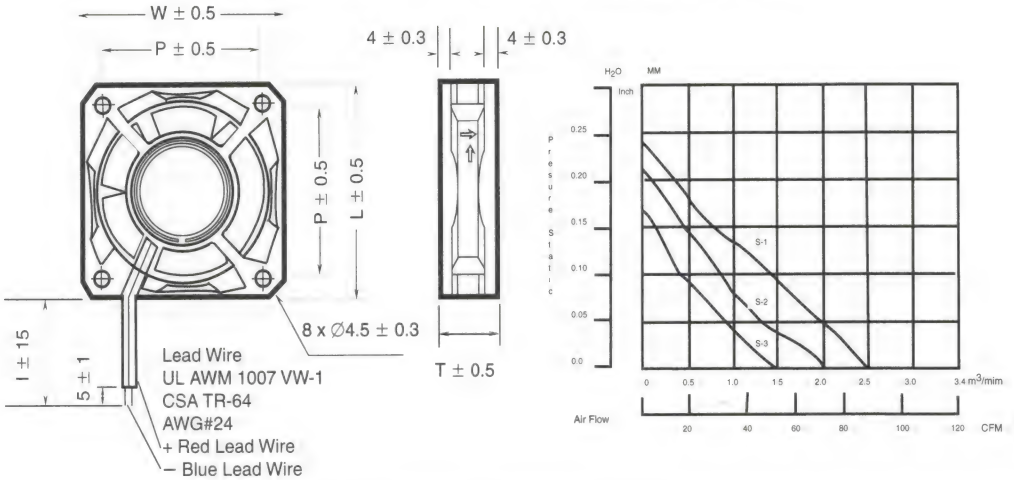
FP108BDC 92x92x25.4mm



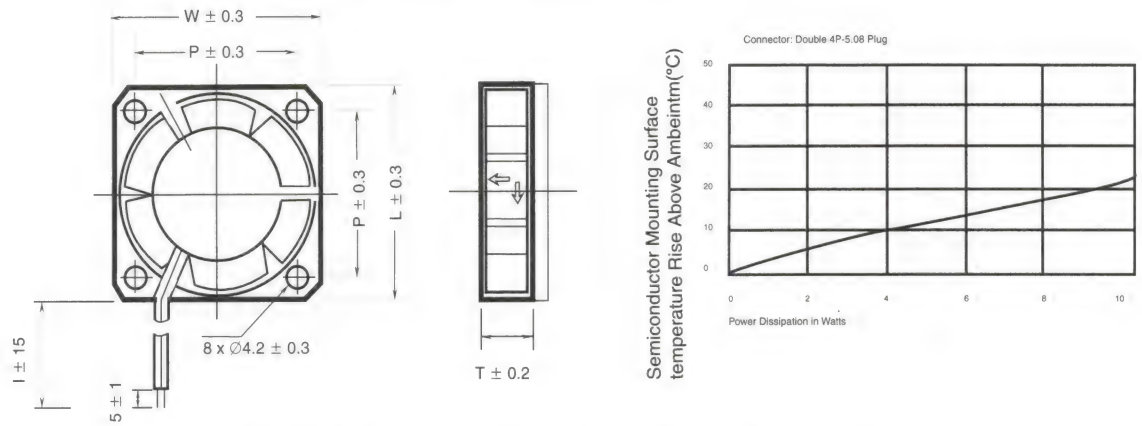


Note: All fans are manufactured to NACC's specifications and meet all applicable international approvals.

FP108MDC 120x120x25.4mm

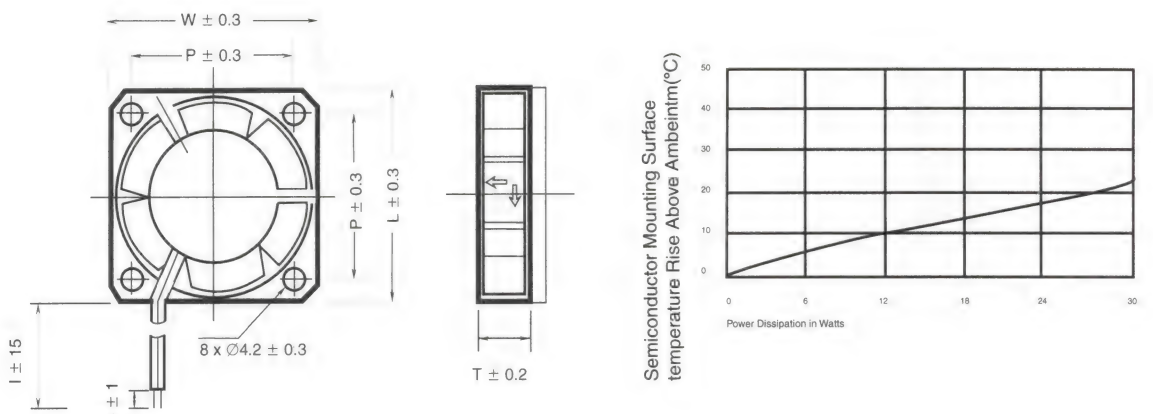


CIC4865 40x40x10.5mm



See page 245 for cooling module assembly chart and heat sink dimensions

CICP620 50x50x12mm



See page 245 for cooling module assembly chart and heat sink dimensions

Note: All fans are manufactured to NACC's specifications and meet all applicable international approvals.

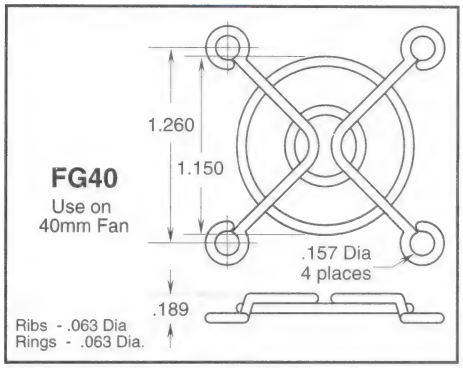
Series FG Wire Form Fan Guards

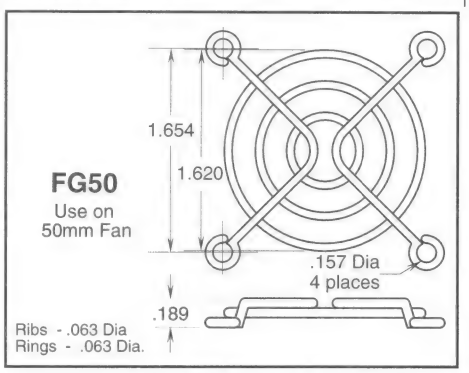
Standard Finish: Nickel Chrome (Black electro deposit and zinc finishes avaialble by special order)

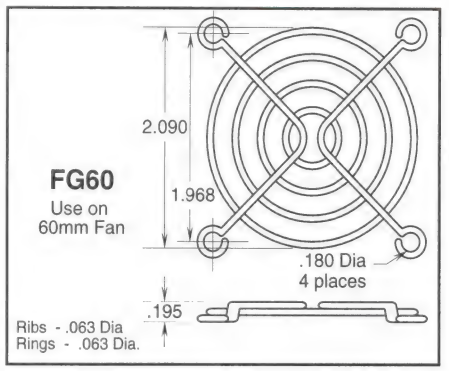
Available Sizes: 40mm, 50mm, 60mm, 80mm, 92mm, & 120mm

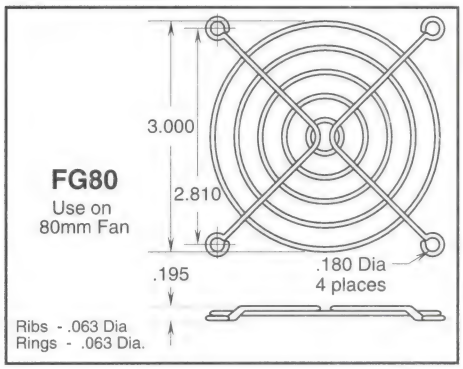
Ring Spacing: 1/4" maximum
Depth of serrations on wire: .015" maximum

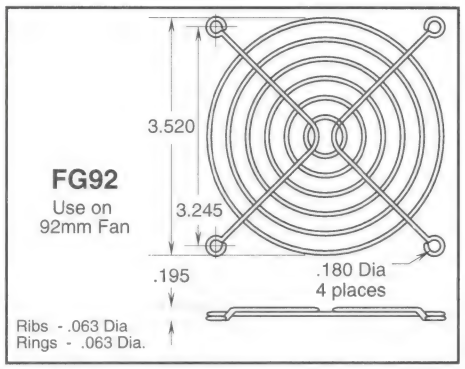
Standard Finish: Nickel chrome
Thickness of nickel chrome: .0005" minimum

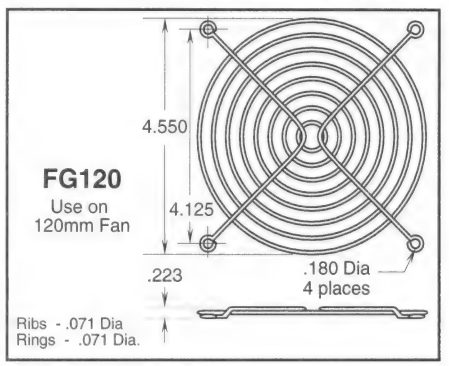












Series GMR Plastic Fan Filter Assemblies

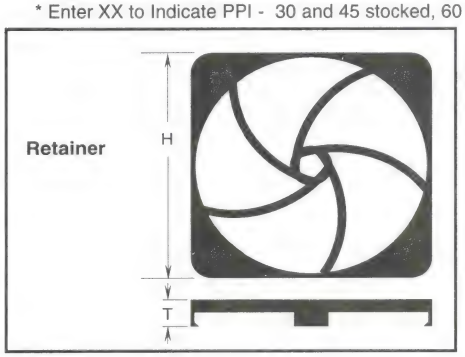
Consists of retainer, media, and guard. When the filter media requires maintenance, the guard portion does not need to be removed. By taking the retainer off, the media is exposed for cleaning and replacement. The fan guard is still attached assuring protection from the fan blade. Available sizes: 60mm, 80mm, 92mm, and 120mm.

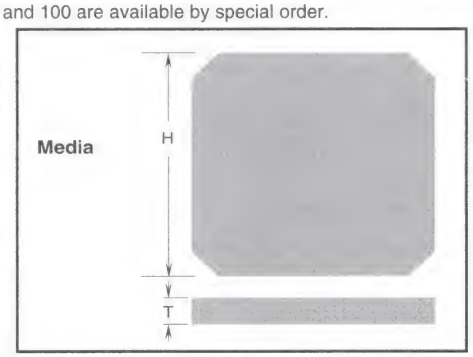
Components

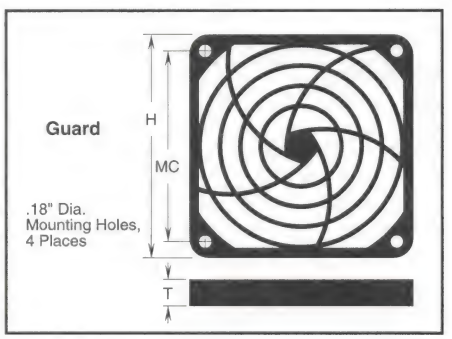
Retainer	Media	Guard
UL listed 94V-0 material	Polyurethane foam material allows free air passage with minimal air resistance and pressure drop. 30PPI and 45PPI are standard (PPI denotes pores per inch). 60 and 100 PPI are available by special order.	UL listed 94V-0 material
Snap on construction	Helps reduce external fan noise.	1/4" maximum ring spacing.
Designed for minimal air restriction	Cleaned easily by vacuuming or washing with most soaps, detergents or cleaning solvents.	Decreased noise level due to design.
		Countersunk mounting holes.
		Withstands high impact.

*Catalog Number	Fits Fan Sizes	H		T		M/C	
		mm	Inches	mm	Inches	mm	Inches
GMR60XX	60mm	56.4	2.220	3.2	.125	50.0	1.969
GMR80XX	80mm	83.6	3.291	10.0	.393	71.4	2.811
GMR92XX	92mm	96.5	3.799	10.0	.393	82.4	3.244
GMR120XX	120mm	123.7	4.870	10.7	.420	104.8	4.126

* Enter XX to Indicate PPI - 30 and 45 stocked, 60 and 100 are available by special order.







Note: All fans are manufactured to NACC's specifications and meet all applicable international approvals.

Index
Controls and Switches

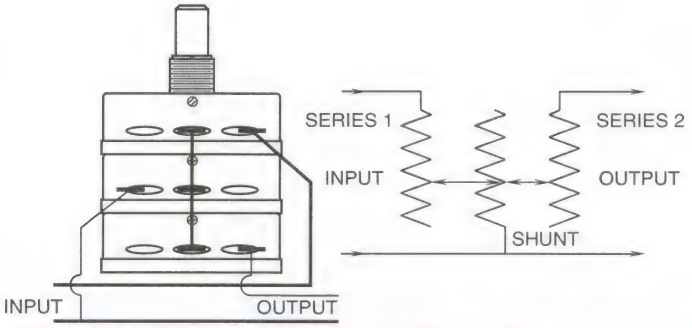
MALLORY

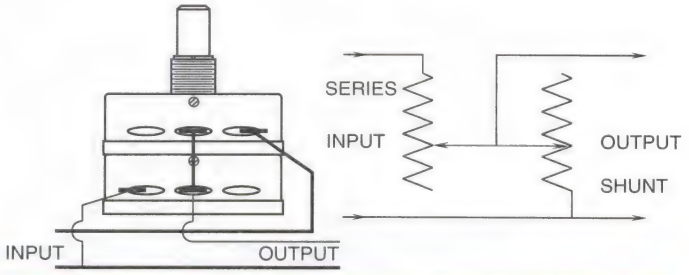
Type	Description	Features	Page Number
Wirewound Controls			
MR	3 Watt Multiple Mounting	Wirewound — Linear Taper	251
M LW MG R	3 to 12.5 Watt	Wirewound Miniature — Bushing Mount	252-253
VW VWS	5 Watt - Rugged Construction	Wirewound Subminiature — Linear Taper	252-253
Wirewound Audio Attenuators			
L Pad	15 Watts — Mono	Wirewound — 2 sections	254
MGL Pad	50 Watts — Mono	Wirewound — 2 Sections — Glass Elements	254
LL Pad	15 Watts — Stereo	Wirewound — 4 Sections	254
MGLL Pad	50 Watts — Stereo	Wirewound — 4 Sections — Glass Elements	254
T Pad	15 Watts — Mono	Wirewound — 3 Sections	255
RT Pad	10 Watts — Mono	Wirewound — 3 Sections	255

T pads are used where it is important that the insertion of the attenuator in the circuit and the amount of the attenuation have no effect upon the impedance relations existing in the circuit. This is achieved by making the image impedance of the T pad equal the generator and load resistance. In the case of the T pad where input impedance is equal to the output impedance, the network is said to be symmetrical about a vertical center line.

L attenuators, or pads, are less expensive than the T type since only two instead of three variable resistors are required to control the attenuation. At the same time, the L attenuator maintains impedance independent of attenuation at only one pair of terminals; whereas the T attenuator maintains constant impedance at both input and output terminals.

L pads are generally used where a number of loads are associated with a common generator and it is necessary to control the power delivered to each load without altering the impedance reflected to the generator. In L pads, one input and one output terminal are connected directly together and the pad is grounded or unbalanced. The variable L pad is composed of two controls on a common shaft with the contact arms externally tied together. As one unit increases in resistance, the other decreases thereby maintaining the impedance, as seen by the source, constant. These L pads may be obtained to match impedances from two ohms to four thousand ohms.



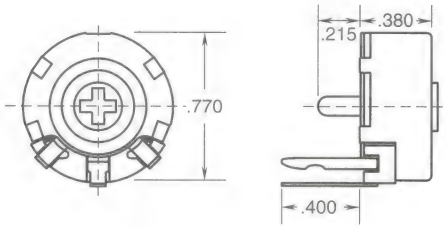


Type	Description	Features	Page Number
Stereo Level Control			
RR Pad	10 Watt — Stereo — For lower priced 4 and 8 Ohm speakers	Wirewound — 2 Sections	255
Rotary Switch			
3000 Series	Multiple Poles and Positions	General purpose — Bushing mount	256
Hardware			
Switch & Control	Knob, Dial Plates, Brackets, Shafts, Nuts & Washers	Wide variety	257

Type MR - 3 Watt
Wirewound Controls

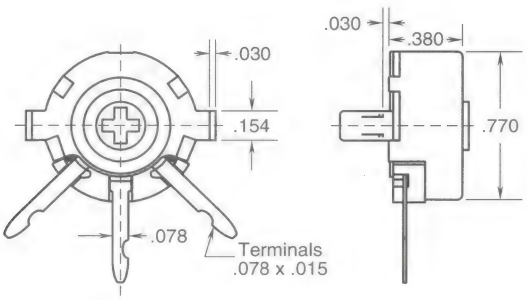
MALLORY

Power Rating:	3 Watts @ 55°C Derate linearly to 0 @ 105°C
Ohms Tolerance:	±20% (Standard) (Other tolerances available)
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC
Stop Strength:	12 inch pounds (Minimum)
Operating Torque:	1/2 - 10 inch ounces
Resistance Taper:	Linear only
Mechanical Rotation:	240
Electrical Rotation:	215
Contact Arm:	Insulated from case.



PC Mount - No Snap

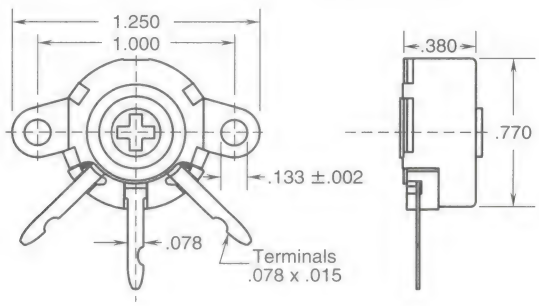
Ohms Rating	Max Amperes	Catalog Number
15	.450	MR15P
100	.170	MR100P
600	.071	MR600P
1K	.055	MR1000P
1.5K	.045	MR1500P
3K	.032	MR3000P
5K	.024	MR5000P



Tab Mount

Ohms Rating	Max Amperes	Catalog Number
50	.240	MR50T
10K	.017	MR10KT

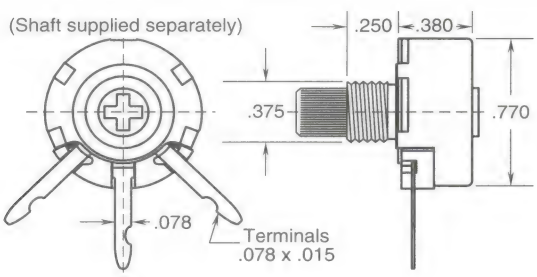
.154 Twist Tab, .246 Long
Center-to-center mounting dimension: - .925



Flange Mount

Ohms Rating	Max Amperes	Catalog Number
100	.170	MR100F
500	.077	MR500F
1K	.055	MR1000F
2.5K	.035	MR2500F

Mounting ear holes - .130 Dia. on 1" centers



Bushing Mount

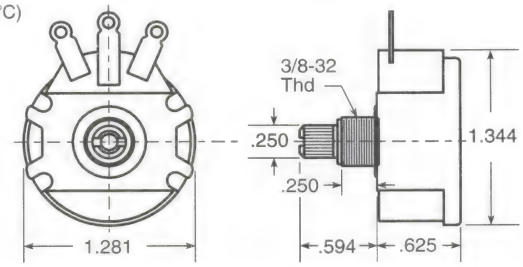
Ohms Rating	Max Amperes	Catalog Number
100	.170	MR100B

Bushing 3/8-32 x 1/4"

3 Watt - R Series

Power Rating:	3 Watts @ 40°C Derated linearly to 0 @ 105°C	Operating Temperature:	-30°C to +105°C
		Operating Life:	10,000 cycles standard
Ohms Tolerance:	± 10% (Standard) (Other tolerances available)	Resistance Taper:	Linear (Other tapers available)
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC	Mechanical Rotation:	297° ±5°
		Bushing Information:	Thread: 3/8-32 NEF-2A
		Contact Arm:	Insulated from case
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)		

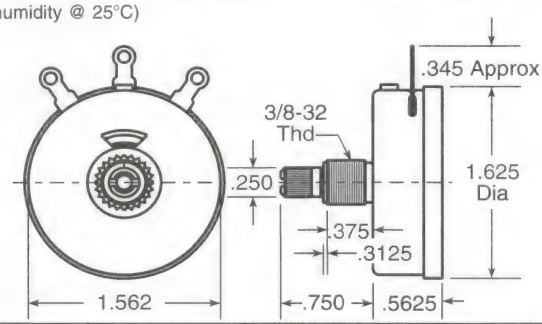
Ohms Rating	Max. Amperes	Catalog Number
10	.548	R10L
500	.077	R500L
1K	.055	R1000L
2.5K	.035	R2500L



4 Watt - M Series

Power Rating:	4 Watts @ 40°C	Operating Temperature:	-55°C to +105°C
Ohms Tolerance:	± 10% (Standard) (Other tolerances available)	Operating Life:	10,000 cycles standard
		Resistance Taper:	Linear (Other tapers available)
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC	Mechanical Rotation:	294° ±5°
		Bushing Information:	Thread: 3/8-32 NEF-2A
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)	Contact Arm:	Insulated from case

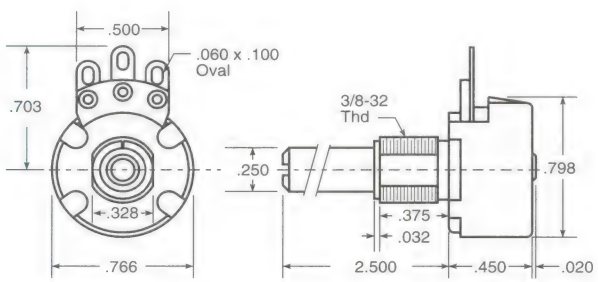
Ohms Rating	Max. Amperes	Catalog Number
1	2.000	M1PK
3	1.150	M3PK
6	.816	M6PK
15	.516	M15PK
25	.400	M25PK
50	.280	M50PK
100	.200	M100PK
200	.140	M200PK
300	.116	M300PK
500	.090	M500PK
1K	.063	M1MPK
2K	.045	M2MPK
5K	.028	M5MPK
10K	.020	M10MPK
20K	.014	M20MPK
25K	.013	M25MPK
50K	.009	M50MPK
100K	.0062	M100MPK



5 Watt - VW Series

Power Rating:	5 Watts @ 35°C	Operating Temperature:	-30°C to +105°C
Ohms Tolerance:	± 10% (Standard) (Other tolerances available)	Operating Life:	10,000 cycles standard
		Resistance Taper:	Linear (Others available)
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC	Mechanical Rotation:	305° ±5°
		Bushing Information:	Thread: 3/8-32 NEF-2A
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)	Contact Arm:	Insulated from case

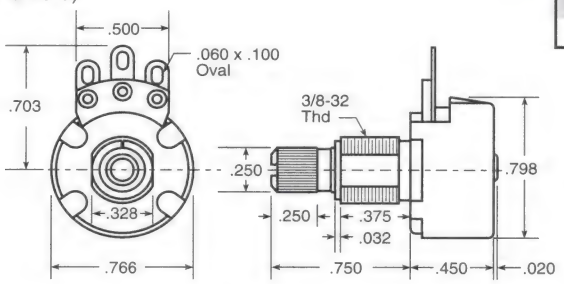
Ohms Rating	Max. Amperes	Catalog Number
1	2.2	VW1
2	1.6	VW2
5	1.0	VW5
8	.750	VW8
10	.710	VW10
15	.580	VW15
20	.500	VW20
25	.450	VW25
50	.320	VW50
100	.220	VW100
200	.160	VW200
250	.140	VW250
300	.130	VW300
500	.100	VW500
1K	.071	VW1K
2K	.050	VW2K
2.5K	.045	VW2P5K
3K	.041	VW3K
4K	.035	VW4K
5K	.032	VW5K
10K	.022	VW10K
20K	.016	VW20K
25K	.014	VW25K



5 Watt - VWS Series

Power Rating:	5 Watts @ 35°C	Operating Temperature:	-30°C to +105°C
Ohms Tolerance:	± 10% (Standard) (Other tolerances available)	Operating Life:	10,000 cycles standard
		Resistance Taper:	Linear (Others available)
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC	Mechanical Rotation:	305° ±5°
		Bushing Information:	Thread: 3/8-32 NEF-2A
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)	Contact Arm:	Insulated from case

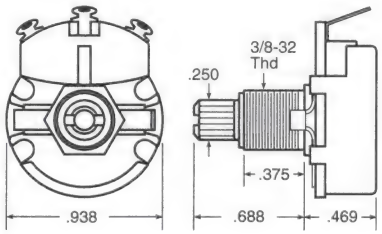
Ohms Rating	Max. Amperes	Catalog Number
1	2.200	VWS1
50	.320	VWS50
100	.220	VWS100
200	.160	VWS200
1K	.071	VWS1K
5K	.032	VWS5K
20K	.016	VWS20K



5 Watts - LW Series

Power Rating:	5 Watts @ 25°C 4 Watts @ 55°C	Operating Temperature:	-30°C to +105°C
		Operating Life:	10,000 cycles standard
Ohms Tolerance:	± 10% (Standard) (Other tolerances available)	Resistance Taper:	Linear only
		Mechanical Rotation:	300° ±5°
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC	Bushing Information:	Thread: 3/8-32 NEF-2A
		Contact Arm:	Insulated from case
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)		

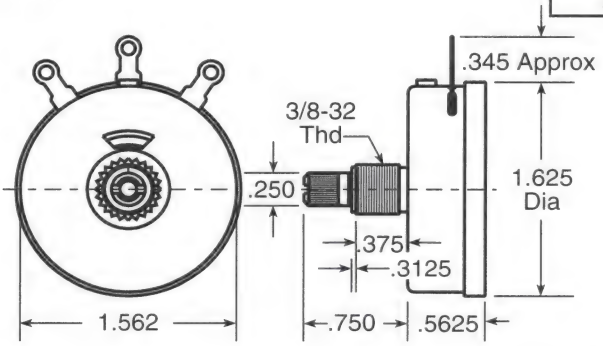
Ohms Rating	Max. Amperes	Catalog Number
5	.890	LW5
8	.710	LW8
10	.630	LW10
25	.450	LW25
50	.280	LW50
100	.200	LW100
250	.130	LW250
500	.089	LW500
1K	.063	LW1K
1.5K	.058	LW1P5K
2.5K	.040	LW2P5K
5K	.028	LW5K
10K	.020	LW10K



12.5 Watts - MG Series

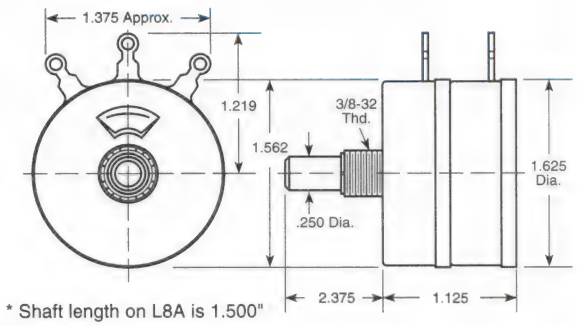
Power Rating:	12.5 Watts @ 40°C Derated linearly to 0°C @ 250°C	Operating Temperature:	-55°C to +250°C
		Operating Life:	10,000 cycles standard
Ohms Tolerance:	± 10% (Standard) (Other tolerances available)	Resistance Taper:	Linear (Other tapers available)
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC	Mechanical Rotation:	294° ±5°
		Bushing Information:	Thread: 3/8-32 NEF-2A
		Contact Arm:	Insulated from case
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)		

Ohms Rating	Max. Amperes	Catalog Number
10	1.100	MG10
25	.710	MG25
50	.550	MG50
500	.160	MG500
1K	.110	MG1000
2.5K	.070	MG2500
25K	.022	MG25K



L Pad Attenuator

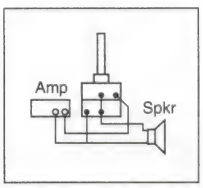
Presents constant impedance to source (Amplifier). Used in audio circuits where output (Speaker) impedance is not critical



* Shaft length on L8A is 1.500"

Power Rating:	4 Watts
Continuous Audio:	15 Watts
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)
Operating Temperature:	-55°C to +105°C
Operating Life:	10,000 cycles standard
Mechanical Rotation:	294° ±5°
Bushing Information:	Thread: 3/8-32 NEF-2A
Contact Arm:	Insulated from case
Terminals:	Solder Lug

Ohms Rating	Catalog Number
4	L4
8	L8
8	L8A *
15	L15
50	L50
600	L600
2000	L2000



MGL Pad Attenuator

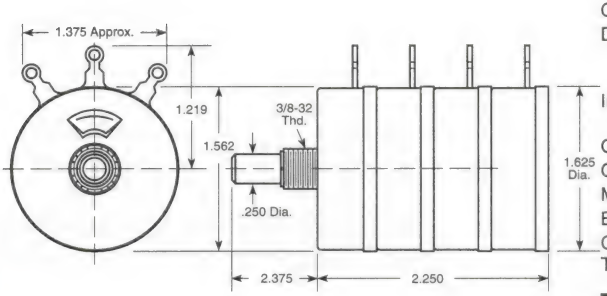
Same as L Pad but with glass element for higher wattage

Power Rating:	12.5 Watts
Continuous Audio:	50 Watts
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)
Operating Temperature:	-55°C to +250°C
Operating Life:	10,000 cycles standard
Mechanical Rotation:	294° ±5°
Bushing Information:	Thread: 3/8-32 NEF-2A
Contact Arm:	Insulated from case
Terminals:	Solder Lug

Ohms Rating	Catalog Number
8	MGL8
16	MGL16

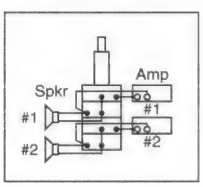
LL Pad Attenuator

Two L pads in tandem for Stereo Level Control



Power Rating:	4 Watts
Continuous Audio:	15 Watts
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)
Operating Temperature:	-55°C to +105°C
Operating Life:	10,000 cycles standard
Mechanical Rotation:	294° ±5°
Bushing Information:	Thread: 3/8-32 NEF-2A
Contact Arm:	Insulated from case
Terminals:	Solder Lug

Ohms Rating	Catalog Number
4	LL4
8	LL8
16	LL16



MGLL Pad Attenuator

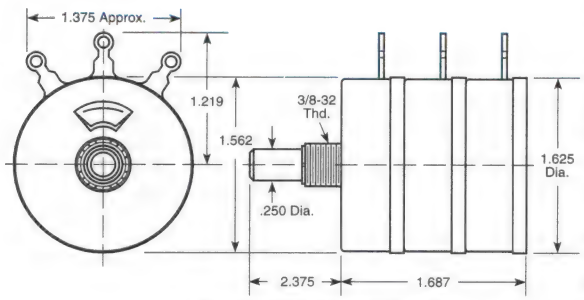
Same as LL Pad but with glass element for higher wattage

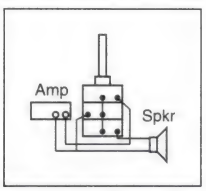
Power Rating:	12.5 Watts
Continuous Audio:	50 Watts
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)
Operating Temperature:	-55°C to +105°C
Operating Life:	10,000 cycles standard
Mechanical Rotation:	294° ±5°
Bushing Information:	Thread: 3/8-32 NEF-2A
Contact Arm:	Insulated from case
Terminals:	Solder Lug

Ohms Rating	Catalog Number
8	MGLL8

All Audio Attenuators are supplied with palnut and dial plate.
Dial Plate 395 for Mono and Dial Plate 495 for Stereo.

T Pad Attenuator



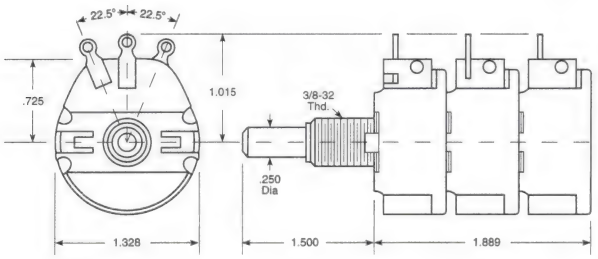


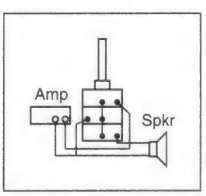
Presents constant impedance to both source (Amplifier) and output (Speaker)

Power Rating:	4 Watts
Continuous Audio:	15 Watts
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC
Insulation Resistance:	1000 megohms minimum. (50% relative humidity @ 25°C)
Operating Temperature:	-55°C to +105°C
Operating Life:	10,000 cycles standard.
Mechanical Rotation:	294° ±5°
Bushing Information:	Thread: 3/8-32 NEF-2A
Contact Arm:	Insulated from case
Terminals:	Solder Lug

Ohms Rating	Catalog Number
8	T8
50	T50
600	T600

RT Pad Attenuator



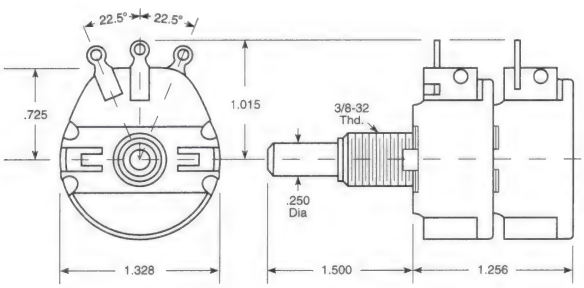


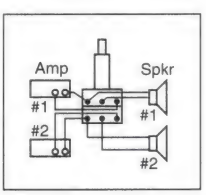
Presents constant impedance to both source (Amplifier) and output (Speaker)

Power Rating:	3 Watts
Continuous Audio:	10 Watts
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C)
Operating Temperature:	-30°C to +105°C
Operating Life:	10,000 cycles standard
Mechanical Rotation:	300° ±5°
Bushing Information:	Thread: 3/8-32 NEF-2A
Contact Arm:	Insulated from case
Terminals:	Solder Lug

Ohms Rating	Catalog Number
8	RT8

Stereo Level Control





50 Ohm tandem dual level control for lower priced 4 and 8 Ohm stereo speakers

Power Rating:	3 Watts
Continuous Audio:	10 Watts
Dielectric Strength:	Mounting plate to terminals, high pot test for 1 minute @ 900 VAC
Insulation Resistance:	1000 megohms minimum (50% relative humidity @ 25°C.)
Operating Temperature:	-30°C to +105°C.
Operating Life:	10,000 cycles standard
Mechanical Rotation:	300° ±5°
Bushing Information:	Thread: 3/8-32 NEF-2A
Contact Arm:	Insulated from case
Terminals:	Solder Lug

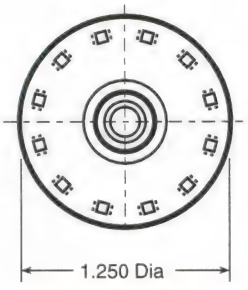
Ohms Rating	Catalog Number
50	RR50

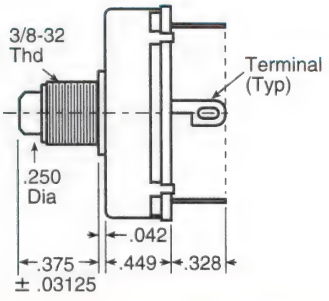
All Audio Attenuators are supplied with palnut and dial plate.
Dial Plate 395 for Mono and Dial Plate 495 for Stereo.

General Purpose Rotary Switches

Positions (Max.): 12
Maximum number of poles: 4
Indexing Angle: 30°
Contact Resistance (initial): Less than .010 ohms
Dielectric Strength: 500 volts AC or 500 volts DC between terminals or terminals to ground
Operating Life: 10,000 cycles
Insulation Resistance: 1000 megohms minimum @ 25°C and 40% relative humidity
Sections: One only
Detent Type: Hill and valley

Terminals: Silver plated high quality non-ferrous material
Ground Rings: Silver plated brass
Insulation: High grade phenolic



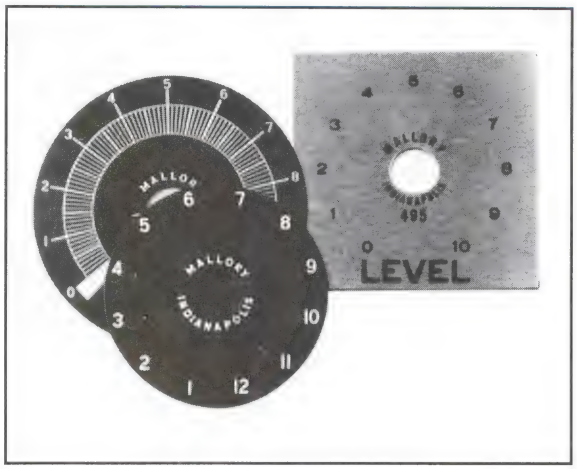


Number of Poles	Maximum Positions	Catalog Number	
		Shorting	Non-Shorting
1	5	—	3215J
1	12	31112J	32112J
2	2	—	3222J
2	3	3123J	3223J
2	6	3126J	3226J
3	4	3134J	3234J
4	2	—	3242J
4	3	3143J	3243J

Electrical Limits @ Voltage			
300 VDC	.2 Amp	300 VAC	.25 Amp
100 VDC	.4 Amp	100 VAC	.5 Amp
50 VDC	1 Amp	50 VAC	1 Amp
25 VDC	2 Amp	25 VAC	2 Amp
12 VDC	4 Amp	12 VAC	4 Amp
6 VDC	5 Amp	6 VAC	6 Amp

North American Capacitor Company/7545 Rockville Road/Indianapolis IN 46214-3073/Phone: (317)273-0090/Fax: (317)273-2400/www.nacc-mallory.com

DIAL PLATES



30° Marking

Aluminum dial plates with figures etched on solid black background.
Diameter is 1-13/16", with a 7/16" hole.
Lettering is 7/16" high, .020" wide.

Markings	Catalog Number
1 to 2	**372**
1 to 3	**373**
1 to 4	**374**
1 to 6	**376**
1 to 7	**377**
1 to 8	**378**
1 to 9	**379**
1 to 10	**380**
1 to 11	**381**
1 to 12	**382**
OFF 1 to 3	**383**
OFF 1 to 9	**389**
OFF 1 to 10	**390**

Other Marking

Aluminum dial plates with figures etched on solid black background.
Similar to dial plates at left, but with various spacing and markings.

Size (Diameter)	Markings	Degrees Spacing	Catalog Number
1-13/16"	1 to 24	15	**394**
2-1/4"	0 to 10	330	**369**
2-1/4"	0 to 10	275	**395**
2-1/4"	0 to 10	260	**397**
2-1/4"	0 to 10	305	**399**
1-13/16"	1 to 17	20	**467**
2" (Square)	Level		**495**

SWITCH and CONTROL KNOBS

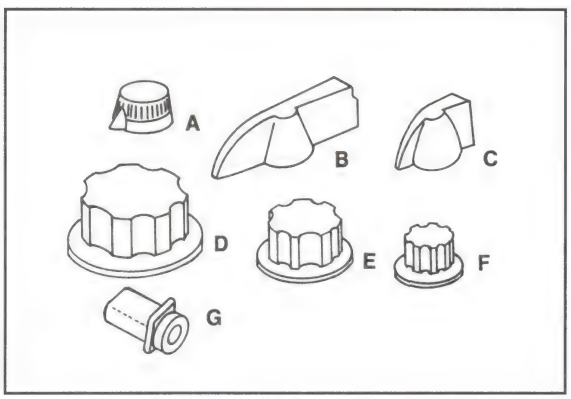
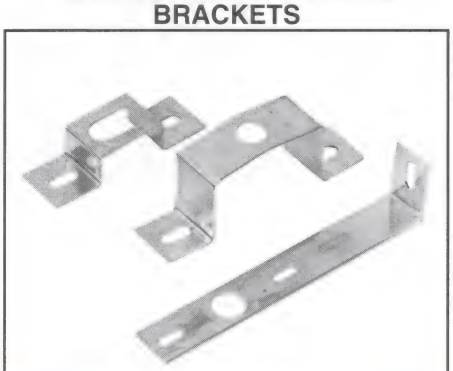


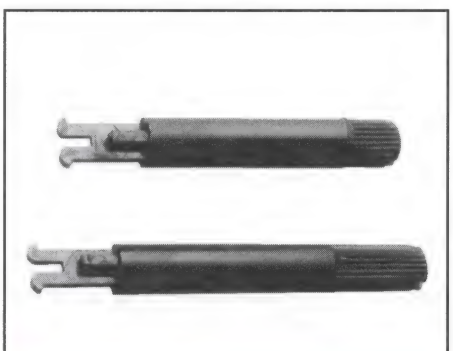
Figure	Description	Shaft Size	Catalog Number
A	11/16" Black Pointer	1/4"	**364**
B	2" Black Bar	1/4"	**365-1**
C	1-1/4" Black	1/4"	**366-1**
D	1-1/2" Black	1/4"	**367-1**
E	1-1/8" Black	1/4"	**368-1**
F	3/4" Black	1/8"	**1910K**
G	9/16" x 13/16" Black for lever switches		**GS5149A**

ADJUSTABLE MOUNTING BRACKETS



Description	Catalog Number
1-1/4" mounting centers	**RB248**
2-1/2" mounting centers	**RB249**
Universal	**RB254**

SHAFTS FOR MR CONTROLS



Description	Catalog Number
1/4" dia x 1-1/4" from front of mounting surface. Knurled and slotted nylon. Plugs into either end of MR controls.	**MRS1250**
1/4" dia x 1-9/16" from front of mounting surface. Knurled and slotted nylon. Plugs into either end of MR controls.	**MRS1563**

HEX NUTS AND WASHERS

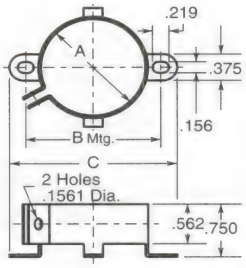
Description	Catalog Number
3/8"-32 Hex Nut	**232**
.218 shoulder length	**255**
.328 shoulder length	**A1126012**
.578 shoulder length	**A112602**
3/8" I.D. metal washer	**225**

TYPE VR VERTICAL MOUNTING CLAMP

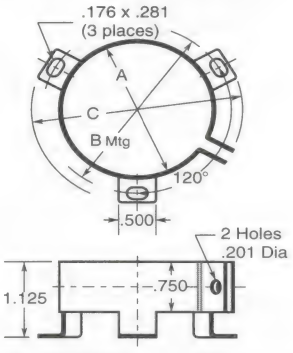
Diameter of Part to be Mounted	Catalog Number			Dimensions		
	Without Screw & Nut	Unassembled Screw & Nut Included	Assembled with Screw & Nut	A	B	C
1" to 1-1/16"	VR1B	VR1	VR1A	1"	1-7/16"	1-7/8*"
1-3/8" to 1-7/16"	VR3B	VR3	VR3A	1-3/8"	1-25/32"	2-7/32"
1-1/2" to 1-9/16"	VR4B	VR4	VR4A	1-1/2"	1-15/16"	2-11/32"
1-3/4" to 1-13/16"	VR6B	VR6	VR6A	1-3/4"	2-1/4"	2-9/16"
2" to 2-1/16"	VR8B	VR8	VR8A	2"	2-1/2"	2-13/16"
2-1/2" to 2-9/16"	VR10B	VR10	VR10A	2-1/2"	3"	3-5/16"
3" to 3-1/8"	VR12B	VR12	VR12A	3"	3-7/16"	3-13/16"
Screw	VRSCREW	—	—	9/16" long 6-32 thread NC-2A		
Nut	VRNUT	—	—	Standard hex nut to fit screw		

NACC VR mounting clamps may be used to mount any cylindrical capacitor with a 1" to 3" diameter that is to be mounted in a vertical position. Material is 1010 CRS, commercial grade #4 temper ASI-scale. Parts are finished with .0001 (nominal) zinc chromate plating. Use for mounting CG types, PSU, HC/NP and MPD/MPF types. Material thickness is .035"

VR1, 3, & 4



VR6, 8, 10, & 12

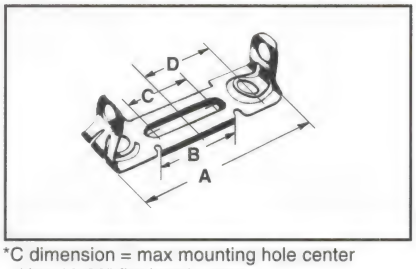


MOUNTING ACCESSORIES FOR PSU AND HC/NP TYPE CAPACITORS

Type HB Horzontal Mounting Bracket

EIA Case Code	Dimensions				Catalog Number
	A	B	C*	D	
1	3-3/8"	1-11/64"	7/8"	1.258	HB2
2-4-6	4-1/64"	1-13/16"	1-1/2"	1-37/64	HB4
3-5-7-8	5-1/64"	2-23/32"	1-25/32"	2-5/64"	HB8

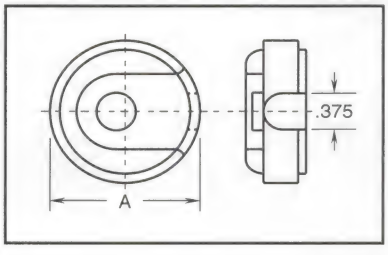
HB brackets are used with PL or PLA end caps. The bracket is assembled to the motor or any suitable surface by two screws in line at any convenient position within the center-to-center dimension (C) shown in the chart.
Material: .042 spring steel with black parkerized finish



*C dimension = max mounting hole center
Use 10-32" flat head screws

Type PL and PLA End Caps

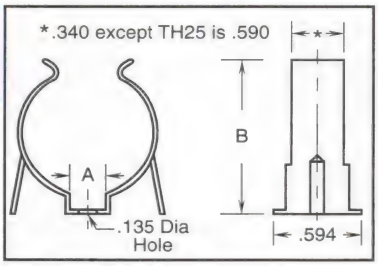
EIA Case Code	A Dimension	Catalog Number	
		Wire Hole Toward Bracket	Wire Hole Away From Bracket
1-2-3	1-7/16"	PL3	PLA3
4-5	1-13/16"	PL6	PLA6
6-7	2-1/16"	PL8	PLA8
8	2-9/16"	PL10	PLA10



PL and PLA end caps are usually used with HB type brackets. The drawing shown at left is type PL for use with the wiring through the bracket to the motor. For off motor mounting, use type PLA. See page 214 for a photo showing a capacitor and end cap mounted in a bracket.

TYPE TH HORIZONTAL MOUNTING CLIP

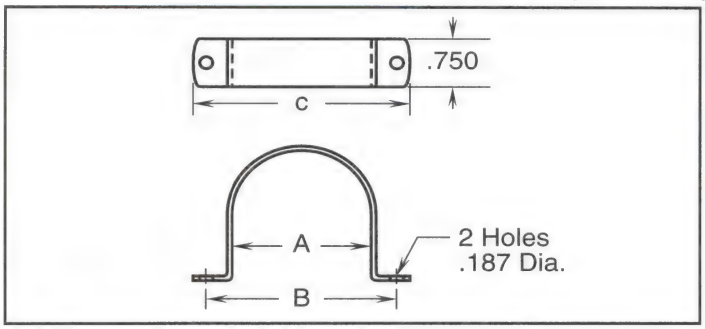
Dimensions			Catalog Number
Nominal Diameter of Part to be Mounted	A	B	
.375	.250	.470	TH13
.500	.250	.620	TH15
.625	.312	.720	TH17
.750	.312	.890	TH19
.875	.312	1.000	TH21
1.000	.312	1.060	TH23
1.375	.312	1.500	TH25



These clips, though designed for capacitors, have varied applications to retain many cylindrical components. They are used extensively in the electrical and electronic industries to hold spindles, condensers, capacitors, tubes, rods and conduit. Clips have phosphate and oil finish.
Material thickness TH13 thru TH17 is .016". TH19 thru TH25 is .020"

MOUNTING ACCESSORIES FOR AC TYPE CAPACITORS

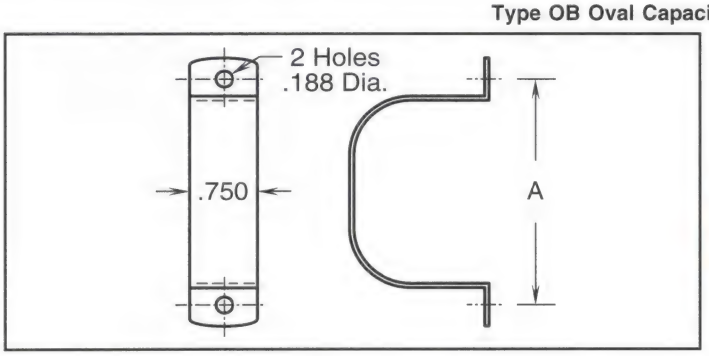
Type RB Cylindrical Capacitor Mounting Clamp



This clamp has a galvanized finish and is designed for use with the round base style motor run capacitor, types MPF.
Material thickness is .035"

Base Style	Dimensions A Nominal Diameter	B	C	Catalog Number
21	1.750	2.500	2.875	RB175
23	2.000	2.750	3.125	RB200
24	2.500	3.250	3.625	RB250
21	1.750	2.500	3.250	RB175A
23	2.000	2.750	3.500	RB200A
24	2.500	3.250	4.000	RB250A

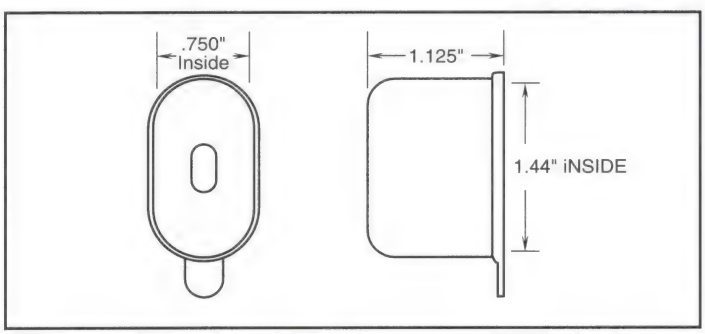
Type OB Oval Capacitor Mounting Clamp



This clamp has a galvanized finish and is designed for use with the flat oval base style AC capacitors, types MPF/MSF.
Material thickness is .036"

Base Style	Dimensions Base Size	A	Catalog Number
32	1-5/16" x 2-5/32"	2-9/16"	OB2
37	1-31/32 x 2-29/32	3-5/16"	OB4
38	1-31/32" x 3-21/32"	4-1/16"	OB3

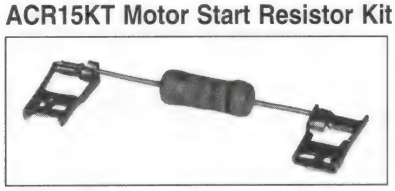
Neoprene Terminal Insulator



For use on capacitor types MPF/MSF, this neoprene terminal insulator, or 'boot', is used to insulate and protect the terminal area of single section units only. Material is classified 94V-1 when tested per UL94.

Order catalog number: **OC1**

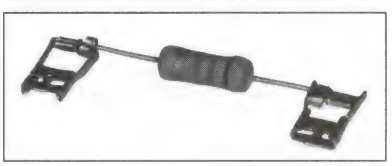
ACR15KT Motor Start Resistor Kit



15K Ohm 2 watt bleeder resistors for AC motor start applications. Saves relay switch contacts and capacitor, particularly in capacitor start-run applications. 1/4" quick connect terminals eliminate need for soldering.

ACR15K:
Pack of 10, 15K Ohm 2 watt bleeder resistor without quick connect terminals.

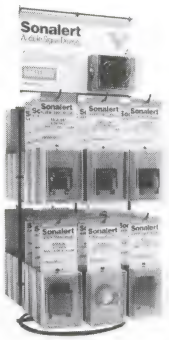
ACR220KT Motor Run Resistor Kit



220K Ohm 1 watt bleeder resistors for AC motor run applications. Saves relay switch contacts and capacitor, particularly in capacitor start-run applications. 1/4" quick connect terminals eliminate need for soldering.

ACR220K:
Pack of 10, 220K Ohm 1 watt bleeder resistor without quick connect terminals.

MALLOBIN & SONAK
Merchandisers



NACC components are available in popular Mallobin Merchandisers. The Mallobin is a handsome, easy to stack display case designed for quick access to a variety of electronic components. The Mallobin is a sturdy, metal cabinet containing fifteen drawers.

When you choose a Mallobin, you can rest assured you will receive the component reliability you have come to expect from NACC. Quantity per each drawer differs for each individual Mallobin kit.

Contact NACC for detailed information or to discuss other possible Mallobin configurations.

The 'SONAK' kit comes complete with 8 of the most popular SONALERT® Audible Signal devices (36 pieces total), individually packaged in see-through hard plastic display boxes. Included is an attractive display rack with a built-in Audible Signal demonstrator.

Catalog Number	Cap µF	Voltage	Description
DISC151M	1 pf to .1 µF	50 VDC to 1000 VDC	An assortment of general purpose disc ceramic capacitors
MONO151A	22 pf to 1 µF	Up to 200 VDC	A collection of monolithic ceramic capacitors
RPE60	.001 µF to 3.3 µF	63 VDC to 1000 VDC	An assortment of radial leaded metallized polyester film 160 series capacitors
RPE6768	.001 µF to 1.0 µF	63 VDC to 250 VDC	A mix of radial leaded metallized polyester film 167 and 168 capacitor series
SK151	1 µF to 6800 µF	10 VDC to 100 VDC	A selection of single ended aluminum electrolytic capacitors.
SMTCER	22 pF to .33 µF	50 VDC to 100 VDC	An offering of ceramic chip capacitors in three different case sizes to include the 0805, 1206 and 1210 sizes
SMTKIT	1-33 µF .1-.22 µF 22pF-.1µF	10 - 35 VDC 50VDC 50 - 100 VDC	Surface mount capacitors: Solid tantalum chips and Multilayer ceramic chips
SX301A	22 pF to 10,000 pF	33 VDC to 630 VDC	This kit includes polystyrene axial leaded capacitors with standard tolerance ratings
TAC151A	.1 µF to 47 µF	10 VDC to 50 VDC	A selection of fully precision axial leaded molded solid tantalum capacitors in high impact resistance epoxy cases

Catalog Number	Cap µF	Voltage	Description
TC151A	20 µF to 2000 µF	Up to 450 VDC	An assortment of axial leaded aluminum electrlytic capacitors similar to TC151
TCG151	100 µF to 10,000 µF	10 VDC to 450 VDC	A selection of tubular computer grade capacitance
TDC151A	.1 µF to 200 µF	Up to 50 VDC	An assortment of epoxy dipped solid tantalum capacitors with capacitance tolerance of ±10%
T491KIT	.47 µF to 68 µF	6 VDC to 35 VDC	This kit consists of tantalum chip capacitors in precision molded cases to offer dimensional consistency and uniform surfaces for pick and place equipment
VPR151	130 µF to 5900 µF	10 VDC to 100 VDC	An assortment of vertical single ended aluminum electrolytic capacitors

SONAK consists of:	6 ea:	BSBM428	3 ea:	BSC616NL
	3 ea:	BSC110	6 ea:	BSC628
	6 ea:	BSC616N	3 ea:	BSC628P
	3 ea:	BSC616NJ	6 ea:	BSNP428

ASK1 consists of:	1ea:		
PS-953	PFD-27N36P	PF-35A29W
PK-16N04W-12	PT-2735FP	PFD-27A35ER
PF-27N36PS	PK-20A38P	PFD-21A29W
PT-2728FP	PK-27A35PS	PB-12N23P-12
PK-20A35EW	PT-3534FP	

» Indicates New Product Offering In This Catalog

Competitive
Cross Reference - Capacitors

MALLORY

Competitive Series	Competitor Name	NACC Series
100	Maida	AT/ATR/ASR
101	Sangamo	CGR
101R	Sangamo	CGR
101X	Sangamo	CGO
109D/130D	Sprague	TLH/TLS
135D	Sprague	THT
137D	Sprague	TLW
138D	Sprague	TXX
139R	Sangamo	CGO
140D	Sprague	XTL/XTH
141D	Sprague	XTV
146D	Sprague	MTP
147D	Sprague	MTP
148D	Sprague	MTP
149D	Sprague	MTP
150D	Sprague	TAS
173D	Sprague	TAC
196D	Sprague	TDC
199D	Sprague	TDL
1C	Sprague	M20
202D	Sprague	TMX/CL55
210	Electrocube	150
230	Electrocube	150
232	Electrocube	160
250	Electrocube	152
272	Johanson	MTR
293D	Sprague	T491
2C	Sprague	M30
3070	Philips	SKA
30D	Sprague	TKA
3120	Philips	CGR
3186	Philips	CGS
3188	Philips	CG/CGR
3191	Philips	CGO
325P	Sprague (CSCI)	21/23/24
325P,OV	Sprague (CSCI)	32/37/38
32D	Sprague	CG
32DR	Sprague	CG
32DX	Sprague	CG
3476	Philips	SK
3480	Philips	SEK
3481	Philips	VPR
3487	Philips	LPX/LPW
3488	Philips	LP, LPW
3489	Philips	LPX/LPW
3534	Philips	PSU
3534B	Philips	PSU
35F	G.E.	PSU
36D	Sprague	CGS
36DY	Sprague	CGS
39D	Sprague	SKA
3C	Sprauge	M40
40AW	Philips	TLT
40BW	Philips	TXT
40CS	Philips	TAC
40CW	Philips	MTP
40ES	Philips	TAC
40EW	Philips	TLH
40GW	Philips	TLW
40JW	Philips	TL/CL55
40LW	Philips	TLS
40SS	Philips	TAS/TER(CSR13)
40SW	Philips	TLX
40TW	Philips	THT
40XS	Philips	TXA/TXE(CSR13)
40XW	Philips	XTH/XTV/ XTM/XTK
40YS	Philips	TXR (CSR33)
40YW	Philips	MTP
40ZS	Philips	THF
41GS	Philips	TDC
41PS	Philips	TIM
43XW	Philips	XTL/XTH/XTV
49MC	Philips	T491
4C	Sprague	M50
500	Sangamo	CG
500D	Sprague	SKA
500R	Sangamo	CG
500X	Sangamo	CG
501D	Sprague	SKA
511D	Sprague	VPR/SEK
515D	Sprague	SK
516D	Sprague	SKA
517D	Sprague	VPR/SEK
52	Johanson	MAV
53D	Sprague	SKA
54	Johanson	MAV
55	Johanson	MAV
56	Johanson	MAV
57	Johanson	MAV
58	Johanson	MAV
592C (B)	Sprague	P10
592C (C)	Sprague	P20
592C (D)	Sprague	P30
592C (E)	Sprague	P40
601	Sprague	TCX
602D	Sprague	CGR
602DX	Sprague	CGR
622D	Sprague	CGO
636D	Sprague	CG
672D	Sprague	VPR
673D	Sprague	VPR
678D	Sprague	VPR
69	Johanson	MTD
703E1	Philips	170
712A1	Philips	DMF
719A1	Philips	160/167/184, 168/185
719F1	Philips	171
719J1	Philips	157X/158X
80	Johanson	MAV
80D	Sprague	LPX/LPW
81D	Sprague	LP, LPW
82D	Sprague	LPX/LPW
910	Electrocube	170
912	Electrocube	171
952	Electrocube	173
A	Philips	P10-P40
AQ	Tansitor	TLT
AR	Tansitor	TXT
AREM	Aerovox	150
ARPK	Aerovox	152
ARPM	Aerovox	170
AS	Tansitor	TXT
AT	Tansitor	TLT
ATC	ATC	MPR
AU	RMC	UN
B1W	Rubycon	SN
BCR	Illinois Cap	C
BPA	Illinois Cap	NKA
BPS	Illinois Cap	SN
C	RMC	C
C315	Kemet	M15
C320	Kemet	M20
C322	Kemet	M22
C330	Kemet	M30
C340	Kemet	M40
C350	Kemet	M50
C410	Kemet	P10
C420	Kemet	P20
C430	Kemet	P30
C440	Kemet	P40
CE02W	Marcon	SKA
CE04W	Marcon	LPX/LPW
CEAUF	Marcon	LP, LPW
CEAWF	Marcon	LPX/LPW
CEBPM	Marcon	SN
CEDSM	Marcon	SK
CESSM	Marcon	SS
CETSU	Marcon	LP, LPW
CETSW	Marcon	LPX/LPW
CEUFM	Marcon	SK
CEUSM	Marcon	SEK
CEUST	Marcon	TKA
CKS	Illinois Cap	SK
CPR	Cornell Dubilier	21
CRC115	Corning	M15
CRC120	Corning	M20
CRC220	Corning	M22
CRC230	Corning	M30
CRS	Cornell Dubilier	23
CRT	Cornell Dubilier	24
CWT	Hilton	MTP
D	Maida	G, C, S, H, L
DD05-DD112	Murata	C, S, H, L
ECCF	Panasonic	G, C, L
ECEA-K	Panasonic	SS
ECEA-U	Panasonic	SK
ECEA-V-S	Panasonic	SK
ECEB-U	Panasonic	TT/SKA
ECEB-V	Panasonic	SKA
ECED-V-S	Panasonic	TT/SKA
		SK
ECES-G	Panasonic	LPX/LPW
ECES-U (1)	Panasonic	LP, LPW
ECKF	Panasonic	H,S
ECQ-E	Panasonic	DMF
ECQ-B (F)	Panasonic	DMF
ECQ-EW	Panasonic	157X/158X
ECQ-P	Panasonic	171
ECQ-T	Panasonic	150
ECQ-Z	Panasonic	152
ECU-M	Panasonic	1206
ECU-N	Panasonic	0805
ECQ-UV	Panasonic	157X/158X
G	Sprague	MPT
GCR	Illinois Cap	G
GL	Panasonic	UN
GR40	Murata	0805
GR42-2	Murata	1210
GR42-6	Murata	1206
GR43-2	Murata	1812
H50	Aerovox	32
H62	Aerovox	38
H64	Aerovox	37
HAQ	Tansitor	THT
HAR	Tansitor	THX
HFR (1)	Richey	SH, SEK

This Cross Reference does not warrant exact interchangeability of components.
In most cases, the terminal configuration, performance specifications, and basic dimensions are similar.
The end user must make the ultimate decision for suitibility of the component in their application.

Competitive
Cross Reference - Capacitors

MALLORY

Competitive Series	Competitor Name	NACC Series
K	Phillips	M15-M50
KBN+SF	Cornell Dubilier	38
KKN+SF	Cornell Dubilier	32
KME (T)	United Chemi-Con	TKA
KME (VB)	United Chemi-Con	TKR
KME (VB)	United Chemi-Con	TMR
KME(VB)	United Chemi-Con	TKR
KMG-VN	United Chemi-Con	LP, LPW
KS130	Saha	130
KTN+SF	Cornell Dubilier	37
LBA	Illinois Cap	LPX/LPW
LC	Richey	SK
LGK	Nichicon	LP
LGQ	Nichicon	LP
LLK	Nichicon	LPX/LPW
LLQ	Nichicon	LPX/LPW
LMU	Illinois Cap	LP
LNR	Nichicon	CGS
LP	Rubycon	LPX/LPW
MA	Murata	MAV
MCH21	Rohm	0805
MCH31	Rohm	1206
MCH32	Rohm	1210
MDI	Richey	TC/TT/SKA
MF	Paktron	160
MHA	Rubycon	VTH/SEK
MKP171	Saha	171
MKP1839	Roederstein	170
MKP1840	Roederstein	171
MKT158X	Saha	157X/158X
MKT160	Saha	160
MKT167	Saha	167/184
MKT1813	Roederstein	150
MKT1817	Roederstein	168/185
MKT1818	Roederstein	167/184
MKT1822	Roederstein	160
MKT185	Saha	168/185
MMK	Rifa/Evox	160
MMK10...27.5	Evox	160
MMK5	Rifa/Evox	168/185
MMK5	Evox	168
MMK7.5	Rifa/Evox	167/184
MMK7.5	Evox	167
MMW	Cornell Dubilier	150
MMWA	Rifa/Evox	150
MMX	Rifa/Evox	158
MP	Paktron	171
MPR	Saha	150
MS7	Rubycon	SS
MV	Murata	MAV
N50	Aerovox	32
N62	Aerovox	38
N64	Aerovox	37
NC	Richey	SN
NTT	Rubycon	NPA
P50	Aerovox	32
P62	Aerovox	38
P64	Aerovox	37
PA	Elpac	170
PMR	Rifa/Evox	171
PMR10...27.5	Evox	171
PMWA	Rifa/Evox	170
PR	Elpac	171
PSA	Aero-M	PSU
PSR	Richey	SXR
PZ	Richey	VPR

Competitive Series	Competitor Name	NACC Series
R09	Johanson	0403
R11	Johanson	0504
R15	Johanson	0805
R18	Johanson	1206
R29	Johanson	1808
RA	Tansitor	TMX
RB	Paktron	160
RBEN	Aerovox	168/185
RBEO	Aerovox	167/184
RBEP	Aerovox	160
RBEX	Aerovox	157X/158X
RMR	Illinois Cap	SEK
RPA10	Murata	P10
RPA20	Murata	P20
RPA30	Murata	P30
RPA40	Murata	P40
RPE110	Murata	M15
RPE113	Murata	M30
RPE114	Murata	M40
RPE117	Murata	M50
RPE121	Murata	M20
RPE122	Murata	M22
RW	Tansitor	TL/CL55
RWC	Paktron	150
RWP	Paktron	170
RZM	Illinois Cap	SXR
RZS	Illinois Cap	SXR
S41	Johanson	1210
S43	Johanson	1812
S47	Johanson	2221
SA10	AVX	P10
SA20	AVX	P20
SA30	AVX	P30
SA40	AVX	P40
SKG (V)	United Chemi-Con	VPR
SM	Richey	SS
SME (T)	United Chemi-Con	TC/TT/SKA
SME (VB)	United Chemi-Con	SK
SME(T)	United Chemi-Con	SKA
SME-BP	United Chemi-Con	SN
SMG-VN	United Chemi-Con	LPX/LPW
SM-BP	United Chemi-Con	NPA
SR15	AVX	M15
SR20	AVX	M20
SR21	AVX	M22
SR30	AVX	M30
SR40	AVX	M40
SR50	AVX	M50
SRAC	United Chemi-Con	SS
ST	Tansitor	THD
STA	Tansitor	TXTE
SWT	Hilton	MTP
T110	Kemet	TAS
T140	Kemet	TXA
T242	Kemet	TXE(CSR23)
T252	Kemet	TXR(CSR33)
T262	Kemet	THF
T322	Kemet	TAC
T330	Kemet	TIM
T350	Kemet	TDL
T351	Kemet	TDL
T352	Kemet	TDL
T353	Kemet	TDL
T354	Kemet	TDC
T355	Kemet	TDC
T356	Kemet	TDL
T361	Kemet	TDL
T362	Kemet	TDC
T368	Kemet	TDC

Competitive Series	Competitor Name	NACC Series
TA	MALLORY	SKA
TAP	Avx	TDL
TE	Sprague	TT/SKA
TLB	Nichicon	TC/TT/SKA
TPS	AVX	T495
TR	Richey	LP
TTA	Illinois Cap	TT/SKA
TTMS	Rubycon	TC/TT/SKA
TTS	Rubycon	TC/SKA
TVA	Sprague	TC/SKA
TVX	Nichicon	TC/TT/SKA
TWMS	Rubycon	SK
UFP	Murata	MHP
ULB	Nichicon	SK
UPF	Nichicon	SXR
UPR	Nichicon	VPR
USK	Nichicon	SS
UVP	Nichicon	SN
UVX	Nichicon	SK
		VPR/SEK
UW	Maida	UN
UW	Tansitor	TLH
UY	Murata	MHK/MHP
VAJ	Murata	MAV
VFR	Nichicon	SH
VJ0805	Vitramon	0805
VJ1206	Vitramon	1206
VJ1210	Vitramon	1210
VTH	MALLORY	SEK
VTL	MALLORY	SK
VTN	MALLORY	SN
VTM	MALLORY	SS
VTZ	MALLORY	SXR
WC	Tansitor	TLS
WC	Paktron	150
WH	Tansitor	TLW
WP	Paktron	170
WT	Tansitor	TLX
WY	Murata	MHQ
X386S,D	ASC	21,23,24
X387S,D	ASC	32,37,38
Z23	Aerovox	21
Z24	Aerovox	23
Z26	Aerovox	24
Z50	Aerovox	32
Z62	Aerovox	38
Z64	Aerovox	37
ZA	Elpac	150
ZDR	Elpac	160

This Cross Reference does not warrant exact interchangeability of components.
In most cases, the terminal configuration, performance specifications, and basic dimensions are similar.
The end user must make the ultimate decision for suitibility of the component in their application.

Competitive
Cross Reference - DC Rotary Fans

MALLORY

Competitive Part Number	Competitor Name	NACC Part Number
2408PL-04W-B30	NMB	FP108FDC12VS2*
2408PL-04W-B40	NMB	FP108FDC12VS2*
2408PL-05W-B30	NMB	FP108FDC24VS2*
2408PL-05W-B40	NMB	FP108FDC24VS2*
2410NL-04W-B10	NMB	FP108FDC12VS2*
2410NL-04W-B20	NMB	FP108FDC12VS2*
2410NL-04W-B30	NMB	FP108FDC12VS1*
2410NL-05W-B10	NMB	FP108FDC24VS2*
2410NL-05W-B20	NMB	FP108FDC24VS2*
2410NL-05W-B30	NMB	FP108FDC24VS1*
2410PL-04W-B20	NMB	FP108FDC12VS2*
2410PL-04W-B30	NMB	FP108FDC12VS1*
2410PL-05W-B20	NMB	FP108FDC24VS2*
2410PL-05W-B30	NMB	FP108FDC24VS1*
3110NL-04W-B10	NMB	FP108DDC12VS2*
3110NL-04W-B20	NMB	FP108DDC12VS2*
3110PL-04W-B20	NMB	FP108DDC12VS2*
3110PL-04W-B30	NMB	FP108DDC12VS2*
3110PL-04W-B40	NMB	FP108DDC12VS1*
3110PL-05W-B40	NMB	FP108DDC24VS2*
3-15-8101	Howard	FP108FDC12VS2*
3-15-8102	Howard	FP108FDC24VS2*
3-15-8103	Howard	FP108FDC12VS1*
3-15-8104	Howard	FP108FDC24VS1*
3-15-8301	Howard	FP108DDC12VS3*
3-15-8302	Howard	FP108DDC24VS3*
3-15-8303	Howard	FP108DDC12VS3*
3-15-8304	Howard	FP108DDC24VS3*
3-15-8305	Howard	FP108DDC12VS2*
3-15-8306	Howard	FP108DDC24VS2*
3-15-8501	Howard	FP108BDC12VS2*
3-15-8502	Howard	FP108BDC24VS2*
3412L	Papst	FP108BDC12VS2*
3414	Papst	FP108BDC24VS2*
3610NL-04W-B10	NMB	FP108BDC12VS2*
3610NL-04W-B20	NMB	FP108BDC12VS2*
3610NL-05W-B40	NMB	FP108BDC24VS2*
3610PL-04W-B20	NMB	FP108BDC12VS2*
3610PL-05W-B30	NMB	FP108BDC24VS2*
612L	Papst	FP108FDC12VS2*
612M	Papst	FP108FDC12VS1*
614L	Papst	FP108FDC24VS2*
614M	Papst	FP108FDC24VS1*
8412	Papst	FP108DDC12VS1*
8412L	Papst	FP108DDC12VS3*
8412M	Papst	FP108DDC12VS2*
8414	Papst	FP108DDC24VS1*
8414L	Papst	FP108DDC24VS3*
8414M	Papst	FP108DDC24VS2*
A32100	Nidec	FP108DDC12VS3*
A32140	Nidec	FP108DDC12VS1*
A32858	Nidec	FP108DDC24VS3*
A32859	Nidec	FP108DDC24VS1*
C33244	Nidec	FP108HXDC12VS1*
C33246	Nidec	FP108HXDC12VS1*
DA120625H	Elina/Indek	FP108FDC12VS1*
DA120625L	Elina/Indek	FP108FDC12VS2*

Competitive Part Number	Competitor Name	NACC Part Number
DA120825H	Elina/Indek	FP108DDC12VS1*
DA120825L	Elina/Indek	FP108DDC12VS3*
DA120825M	Elina/Indek	FP108DDC12VS2*
DA120925L	Elina/Indek	FP108BDC12VS2*
DA240625H	Elina/Indek	FP108DDC24VS1*
DA240625L	Elina/Indek	FP108FDC24VS2*
DA240825H	Elina/Indek	FP108DDC24VS2*
DA240825L	Elina/Indek	FP108DDC24VS3*
DA240825M	Elina/Indek	FP108DDC24VS2*
DA240925H	Elina/Indek	FP108BDC24VS2*
DFA0612L	Delta	FP108FDC12VS1*
DFA062H	Delta	FP108FDC24VS1*
DFA0812H	Delta	FP108DDC12VS1*
DFA0812L	Delta	FP108DDC12VS3*
DFA0812M	Delta	FP108DDC12VS2*
DFA0824H	Delta	FP108DDC24VS2*
DFA0824L	Delta	FP108DDC24VS3*
DFA0824M	Delta	FP108DDC24VS2*
DFA0912L	Delta	FP108DDC12VS2*
DFA0924H	Delta	FP108BDC24VS2*
FB24B3 031169	Rotron	FP108BDC24VS2*
FBH-06A12HN	Panasonic	FP108FDC12VS1*
FBH-06A12LN	Panasonic	FP108FDC12VS2*
FBH-06A24HN	Panasonic	FP108FDC24VS1*
FBH-06A24LN	Panasonic	FP108FDC24VS2*
FBK-06A12H	Panasonic	FP108FDC12VS1*
FBK-06A12L	Panasonic	FP108FDC12VS2*
FBK-06A24H	Panasonic	FP108FDC24VS1*
FBK-06A24L	Panasonic	FP108FDC24VS2*
FBK-08A12H	Panasonic	FP108DDC24VS1*
FBK-08A12L	Panasonic	FP108DDC12VS3*
FBK-08A12M	Panasonic	FP108DDC12VS2*
FBK-08A24H	Panasonic	FP108DDC24VS2*
FBK-08A24L	Panasonic	FP108DDC24VS3*
FBK-08A24M	Panasonic	FP108DDC24VS2*
FBK-09A12L	Panasonic	FP108BDC12VS2*
FBK-09A24H	Panasonic	FP108BDC24VS1*
FBN-08A12HN	Panasonic	FP108DDC12VS1*
FBN-08A12LN	Panasonic	FP108DDC12VS3*
FBN-08A12MN	Panasonic	FP108DDC12VS2*
FBN-08A24HN	Panasonic	FP108DDC24VS2*
FBN-09A12LN	Panasonic	FP108BDC12VS2*
FBN-09A24HN	Panasonic	FP108BDC24VS2*
FDC60-12L	Elina/Indek	FP108FDC12VS2*
FDC60-24H	Elina/Indek	FP108FDC24VS1*
FDC60-24L	Elina/Indek	FP108FDC24VS2*
FDC60S-12H	Elina/Indek	FP108FDC12VS1*
FDC60S-12L	Elina/Indek	FP108FDC12VS2*
FDC60S-12M	Elina/Indek	FP108FDC12VS1*
FDC60S-24H	Elina/Indek	FP108FDC24VS1*
FDC60S-24L	Elina/Indek	FP108FDC24VS2*
FDC60S-24M	Elina/Indek	FP108FDC24VS1*
FDC80-24H	Elina/Indek	FP108FDC24VS2*
FDC80-24L	Elina/Indek	FP108DDC24VS3*
FDC80-24M	Elina/Indek	FP108DDC24VS2*
FE12B3 031162	Rotron	FP108DDC12VS1*
FE12F3 031166	Rotron	FP108DDC12VS3*
FE12H3 031164	Rotron	FP108DDC12VS2*
FE24B3 031163	Rotron	FP108DDC24VS2*
FE24H3 031165	Rotron	FP108DDC24VS2*
FL12A306 032269	Rotron	FP108FDC12VS1*
FL12A308 032258	Rotron	FP108FDC12VS1*

Competitive Part Number	Competitor Name	NACC Part Number
FL12G306 032271	Rotron	FP108FDC12VS1*
FL12G308 032260	Rotron	FP108DDC12VS2*
FL24A306 032270	Rotron	FP108DDC24VS1*
FL24A308 032259	Rotron	FP108DDC24VS2*
FL24G306 032272	Rotron	FP108DDC24VS2*
FL24G308 032261	Rotron	FP108DDC24VS2*
FN12F3 031172+	Rotron	FP108BDC12VS2*
FS12F3 031160+	Rotron	FP108FDC12VS2*
FS12H3 031158+	Rotron	FP108FDC12VS1*
FS24F3 031161+	Rotron	FP108FDC24VS1*
FS24H3 031159+	Rotron	FP108FDC24VS1*
KD1206PTS1	Sunon	FP108FDC12VS1*
KD1206PTS3	Sunon	FP108DDC12VS1*
KD1208PTB1	Sunon	FP108FDC12VS1*
KD1208PTB2	Sunon	FP108DDC12VS1*
KD1208PTB3	Sunon	FP108DDC12VS3*
M33402	Nidec	FP108FDC12VS2*
M33403	Nidec	FP108FDC24VS2*
M33404	Nidec	FP108FDC12VS1*
M33405	Nidec	FP108FDC24VS1*
M33418	Nidec	FP108BDC12VS2*
M33423	Nidec	FP108BDC24VS2*
MMF-06C12DH	Mitsubishi	FP108FDC12VS1*
MMF-06C12DL	Mitsubishi	FP108FDC12VS2*
MMF-06C12DM	Mitsubishi	FP108FDC12VS2*
MMF-06C12DS	Mitsubishi	FP108FDC12VS1*
MMF-06C24DH	Mitsubishi	FP108FDC24VS1*
MMF-06C24DL	Mitsubishi	FP108FDC24VS2*
MMF-06C24DM	Mitsubishi	FP108FDC24VS2*
MMF-06C24DS	Mitsubishi	FP108FDC24VS1*
MMF-06D12DH	Mitsubishi	FP108FDC12VS1*
MMF-06D12DL	Mitsubishi	FP108FDC12VS2*
MMF-06D12DL	Mitsubishi	FP108FDC24VS2*
MMF-06D12DM	Mitsubishi	FP108FDC12VS1*
MMF-06D24DH	Mitsubishi	FP108FDC24VS1*
MMF-06D24DM	Mitsubishi	FP108FDC24VS1*
MMF-08C12DH	Mitsubishi	FP108DDC24VS1*
MMF-08C12DL	Mitsubishi	FP108DDC12VS2*
MMF-08C12DM	Mitsubishi	FP108DDC12VS1*
MMF-08C12DS	Mitsubishi	FP108DDC12VS1*
MMF-08C24DL	Mitsubishi	FP108DDC24VS2*
MMF-09B12DL	Mitsubishi	FP108BDC12VS2*
MMF-09B24DH	Mitsubishi	FP108BDC24VS1*
PO012-12D-2B	Interfan	FP108BDC24VS2*
PO025-12D-3B	Interfan	FP108FDC12VS2*
PO025-24D-3B	Interfan	FP108DDC12VS2*
PO034-12D-3B	Interfan	FP108DDC24VS2*
PO034-24D-2B	Interfan	FP108BDC12VS2*
PO034-24D-3B	Interfan	FP108FDC24VS2*
TF-DD-60-12-RXA	Toyo	FP108FDC12VS1*
TF-DD-60-12-RXAL	Toyo	FP108FDC12VS2*
TF-DD-60-24-RXA	Toyo	FP108FDC24VS1*
TF-DD-60-24-RXAL	Toyo	FP108FDC24VS2*
TF-DD-80-12-RXA	Toyo	FP108DDC12VS1*
TF-DD-80-12-RXAL	Toyo	FP108DDC12VS2*
TF-DD-80-24-RXA	Toyo	FP108DDC24VS2*
TF-DD-80-24-RXAL	Toyo	FP108DDC24VS2*
TF-DD-92-24-RXA	Toyo	FP108BDC24VS2*

* Indicate Bearing = B = Ball

This Cross Reference does not warrant exact interchangeability of components.
In most cases, the terminal configuration, performance specifications, and basic dimensions are similar.
The end user must make the ultimate decision for suitibility of the component in their application.

Conversion Charts

MALLORY

Capacitance

(μF) Micro-farad	(nF) Nano-farad	(pF) Pico-farad
.0001	.10	100
.00012	.12	120
.00015	.15	150
.00018	.18	180
.0002	.20	200
.00022	.22	220
.00025	.25	250
.00027	.27	270
.0003	.30	300
.00033	.33	330
.00039	.39	390
.0004	.40	400
.00047	.47	470
.0005	.50	500
.00056	.56	560
.00068	.68	680
.00075	.75	750
.00082	.82	820

(μF) Micro-farad	(nF) Nano-farad	(pF) Pico-farad
.001	1.0	1,000
.0012	1.2	1,200
.0015	1.5	1,500
.002	2.0	2,000
.0022	2.2	2,200
.0025	2.5	2,500
.0027	2.7	2,700
.003	3.0	3,000
.0033	3.3	3,300
.0039	3.9	3,900
.0047	4.7	4,700
.0056	5.6	5,600
.0068	6.8	6,800
.0082	8.2	8,200

(μF) Micro-farad	(nF) Nano-farad	(pF) Pico-farad
.01	10	10,000
.012	12	12,000
.015	15	15,000
.018	18	18,000
.022	22	22,000
.027	27	27,000
.033	33	33,000
.039	39	39,000
.047	47	47,000
.056	56	56,000
.068	68	68,000
.082	82	82,000
.1	100	100,000
1.0	1,000	1,000,000

Dimensions

Inch	Decimal	mm
	.008	.203
1/64	.0156	.397
	.023	.584
1/32	.0312	.794
	.039	.991
3/64	.0469	1.191
	.054	1.372
1/16	.0625	1.588
	.070	1.778
5/64	.0781	1.984
	.086	2.184
3/32	.0937	2.381
	.102	2.591
7/64	.1094	2.778
	.117	2.978
1/8	.125	3.175
	.133	3.378
9/64	.1406	3.572
	.148	3.759
5/32	.1562	3.969
	.164	4.166
11/64	.1719	4.366
	.180	4.572
3/16	.1875	4.763
	.195	4.953
13/64	.2031	5.159
	.211	5.359
7/32	.2187	5.556
	.227	5.766
15/64	.2344	5.953
	.242	6.147
1/4	.250	6.350

Inch	Decimal	mm
	.258	6.553
7/64	.2656	6.747
	.273	6.934
9/32	.2812	7.144
	.289	7.341
19/64	.2969	7.541
	.305	7.747
5/16	.3125	7.938
	.320	8.128
21/64	.3281	8.334
	.336	8.534
11/32	.3437	8.731
	.352	8.941
23/64	.3594	9.128
	.367	9.322
3/8	.375	9.525
	.383	9.728
25/64	.3906	9.922
	.398	10.109
13/32	.4062	10.318
	.414	10.516
27/64	.4219	10.716
	.430	10.922
7/16	.4375	11.113
	.445	11.303
29/64	.4531	11.509
	.461	11.709
15/32	.4687	11.906
	.477	12.116
31/64	.4844	12.303
	.492	12.497
1/2	.500	12.700

Inch	Decimal	mm
	.508	12.903
33/64	.5156	13.097
	.523	13.284
17/32	.5312	13.494
	.539	13.691
35/64	.5469	13.891
	.555	14.097
9/16	.5625	14.288
	.570	14.478
37/64	.5781	14.684
	.586	14.884
19/32	.5937	15.081
	.602	15.291
39/64	.6094	15.478
	.617	15.672
5/8	.625	15.875
	.633	16.078
41/64	.6406	16.272
	.648	16.459
21/32	.6562	16.669
	.6640	16.866
43/64	.6719	17.066
	.680	17.272
11/16	.6875	17.463
	.695	17.653
45/64	.7031	17.859
	.711	18.059
23/32	.7187	18.256
	.727	18.466
47/64	.7344	18.653
	.742	18.847
3/4	.750	19.050

Inch	Decimal	mm
	.756	19.202
49/64	.7656	19.447
	.773	19.634
25/32	.7812	19.843
	.789	20.041
51/64	.7969	20.240
	.805	20.447
13/16	.8125	20.638
	.820	20.828
53/64	.8281	21.034
	.836	21.234
27/32	.8437	21.431
	.852	21.641
55/64	.8594	21.828
	.867	22.022
7/8	.8750	22.225
	.883	22.428
57/64	.8906	22.622
	.898	22.809
29/32	.9062	23.019
	.914	23.216
59/64	.9219	23.416
	.930	23.622
15/16	.9375	23.813
	.945	24.003
61/64	.9531	24.209
	.961	24.409
31/32	.9687	24.606
	.977	24.816
63/64	.9844	25.003
	.992	25.197
1.000	1.000	25.400

International Manufacturing Representatives

MALLORY

AUSTRALIA

K.D. FISHER & COMPANY PTY., LTD.
18 BENJAMIN ST, P.O. BOX 170
ST MARYS, ADELAIDE, S. AUSTRALIA
AUSTRALIA 5042

FAX: 61-8-8276-4024
PHONE: 61-8-8277-3288

AUSTRIA

NOVITRONIC GES. M.B.H.
GRAWATSCHGASSE 4
A-1230 WIEN
AUSTRIA

FAX: 43-222-665-2524
PHONE: 43-222-665-2525

BELGIUM

SERVOTRONICS PVBA
WASSERIJSTRAAT 3
B - 2900 SCHOTEN
BELGIUM

FAX: 32-3-326-1393
PHONE: 32-3-326-4666
E-mail: mail@servotronic.be

BRAZIL

LSI COMERCIO
R. REPUBLICA De El SALVADOR, 99
04910-020 SAO PAULO
BRAZIL

FAX: 55-11-5514-4964
PHONE: 55-11-5514-6366
E-mail: morgan@amcham.com.br

CHILE

ANDREW GOLDFLAM
CASILLA 2852
SANTIAGO
CHILE

FAX: 562-232-8002
PHONE: 2325425

COLOMBIA

CENTRO De ACCESORIOS, CENTRACC Ltda.
CARRERA 12, No. 71-40
BOGOTA, COLOMBIA

FAX: 57-1-211-4318
PHONE: 57-1-346-5159
PHONE: 57-1-245-2562

DENMARK

K. KAMUK APS
P.O. BOX 149
BREDEBOVEJ 31
DK-2800 LYNGBY
DENMARK

FAX: 45-45-88 40 77
PHONE: 45-45-88 38 33

EGYPT

INDOMAR TRADING Co.
91(A) GESR El SUEZ St.
P.O.B. 1012 HELIOPOLIS BAHARY
CAIRO 11737, EGYPT

FAX: 202-45-54-305
PHONE: 202-43-061

FINLAND

BERENDSEN COMPONENTS Oy
P.O.B. 154
FIN-01511 VANTAA
FINLAND

FAX: 358-9-4130-8370
PHONE: 358-9-413-0800
E-mail: vesa.svartstrom@edfi.berendsen.com

FRANCE

RDI
5-7 ALLEE LOUIS BREGUET
93421 VILLEPINTE
FRANCE

FAX: 19-33-149-63-56-56
PHONE: 19-33-149-63-12-72

GERMANY

ADELCO ELEKTRONIK GMBH
BOXHOMSTR. 5
D25451 QUICKBORN/HAMBURG
GERMANY

FAX: 49-4106-3852
PHONE: 49-4106-2024
E-mail: adelco@compuserve.com

NOVITRONICS GMBH
DONAUSTRASSE 36
D-90451 NURNBERG
GREMANY

Fax: 41-911-643044
Phone: 41-911-643011

GUATEMALA

PRESTELECTRO
APARTADO POSTAL 219-A
01909 GUATEMALA
CENTRAL AMERICA

FAX: 502-2-320-997
PHONE: 502-2-320997 or 320941

HOLLAND

NEDELKO B.V. ELECTRONICS
SHEFFIELD STRAAT 2
3047AP ROTTERDAM
HOLLAND

FAX: 31-10-437-4589
PHONE: 31-10-437-4333
E-mail: nedelko@worldaccess.nl

HONG KONG

PATRICK TRADING CORP.
1608-1611 SHUI ON CENTRE
6-8 HARBOUR RD, WANCHAI
HONG KONG

FAX: +852-519-6180
PHONE: 852-827-9977
E-mail: ptch@netvigator.com

INDIA

HINDCO CORPORATION
SHIV-E-NUMH
205-A DR. ANNIE BESANT RD.
WORLI NAKA
BOMBAY 400-018
INDIA

FAX: 91-22-493-6948 or 91-22-624-9132
PHONE: 91-22-493-1544 or 620-3342

ISRAEL

BORAN TECHNOLOGIES LTD.
P.O. BOX 2627
PETAH-TIKVA 49125
ISRAEL

FAX: 972-3-927-4741
PHONE: 972-3-927-4747

ITALY

LED S.R.L.
TURIN HDQ
VIA AMEDEO RAVINA 36
10153 TURIN, ITALY

FAX: 39-11-248-5293
PHONE: 39-11-244-5111

JAPAN

CURTIS INST PACIFIC, INC.
BANCHO HOUSE, ICHIBANCHO
CHIYODA-KU
TOKYO, 102 - JAPAN

FAX: 81-3-3288-7914
PHONE: 81-3-3288-7911

KOREA

DAEMYUNG SYSTEM ELECTRONIC Co.
JEONGHYUN Bldg. 301
300-9 GALHYUN-DONG, YUN-PYUNG GU
SEOUL 122-051
KOREA

FAX: 822-359-0764
PHONE: 822-388-6269
E-mail: dmjs@unitel.co.kr

MEXICO

BESSER ELECTRINICA, SA DE CV
EJIDOS 214-LOS REVES 1XTACALA
EDO. De MEXICO
MEXICO C.P. 54070

Fax: 525-390-7682
Phone: 525-565-3232

International Manufacturing Representatives

MALLORY

MEXICO

(SALES OFFICE)
BESSER ELECTRONICA, SA DE CV
1593 CONTINENTAL ST.
SUITE 117
SAN DIEGO, CA 92173

Fax: 619-661-1974
Phone: 619-661-1650

NEW ZEALAND

K.D. FISHER & COMPANY PTY., LTD.
18 BENJAMIN ST, P.O. BOX 170
ST MARYS, ADELAIDE, S. AUSTRALIA
AUSTRALIA 5042

FAX: 61-8-8276-4024
PHONE: 61-8-8277-3288

NORWAY

ACTE NC NORWAY AS
(Div. POWER & SYSTEMS)
VESTVOLLVEIEN 10, Pob 190
N-20-20 SKEDSMOKORSET
NORWAY

FAX: 47-6387-9000
PHONE: 47-6389-8900
E-mail: haraldw@acte.no

PHILIPPINES

CARR INTERNATIONAL
P.O. BOX 1849
SUITE 612-613
BANK OF P.I. BLDG.
150 PLAZA CERVANTES
MANILA, PHILIPPINES

FAX: 632-815-2809 or 632-242-0955
PHONE: 632-242-0952 or 632-242-1069
E-mail: carrintl@skylnet.net

POLAND

ROPLA-LOKIS ELEKTRONIK
WYBREZE J. SLOWACKIEGO 12-14
50-411 WROCLAW
POLAND

FAX: 48-71-72-4132
PHONE: 48-71-72-5147
E-mail: ropla@poczta.gnet.pl

PORTUGAL

ANATRONIC SA
RUE PADRE ANTONIO VIEIRA NR. 31-B
POVA De SANTO ADRIAO
2675 ODIVELAS, PORTUGAL

FAX: 351-193-71834
PHONE: 351-193-76267 & 87

ANATRONIC SA
RUA MARQUES AVEIRO
Edif. VERA CRUZ
60 Dto TRAS
3800 AVEIRO, PORTUGAL

FAX/PHONE: 34-385-428

SAUDI ARABIA

SEGAM TRADING SERVICES
POB 8510
DAMMAN 31492
SAUDI ARABIA

FAX: 966-3-833-8929
PHONE: 966-3-833-4133

SINGAPORE-MALAYSIA INDONESIA

KULTHORN ENGINEERING LTD. PART.
BLK 387, TAMPINESE
STREET 32, #06-93
SINGAPORE 520-387

FAX: 65-788-7106
PHONE: 65-788-9874

REP. SOUTH AFRICA

TALTRONICS (PTY) LTD.
99 VAN RIE BEECK AVE
P.O. BOX 2578 EDENVALE, 1610
REP. OF SOUTH AFRICA

FAX: 27-11-452-6159
PHONE: 27-11-452-6155
E-mail: talpower@hixnet.co.za

SPAIN

ANATRONIC SA
PASEO IMPERIAL
8 PLANTA 3A-30B
28005 MADRID
SPAIN

FAX: 34-91-365-5095
PHONE: 34-91-366-0159
E-mail: anatronic@tsai.es

SWEDEN

AB SWEDECO
TJADERVAGEN 26
S-181 40 LIDINGO
SWEDEN

FAX: 08-767-3027
PHONE: 08-767-6989

SWITZERLAND

NOVITRONIC AG
ELEKTR BAUELEMENTE
THURGAUERSTRASSE 74
CH-8050 ZURICH
SWITZERLAND

FAX: 41-1-302-1818
PHONE: 41-1-302-2121
E-mail: info@novitronic.ch

TAIWAN

HELM ENG & TRADING CO.
SEC-1 HSI CHIN
10F-7, No. 79, HSIN TAI WU RD.
221 TAIPEI HSIEN, TAIWAN

FAX: 886-2-2698-9613
PHONE: 886-2-2698-9955
E-mail: helm@ms8.hinet.net

THAILAND - MALAYSIA INDONESIA - SINGAPORE

KULTHORN ENGINEERING LTD. PART.
237 LARN LUANG RD.
P.O. BOX 2790
BANGKOK 10100
THAILAND

FAX: 662-280-1444
PHONE: 662-282-1513

TURKEY

RADEL ELEKTRONIK DIS TICARET
VE SANAY, A.S.
NECATIBEY CAD No. 119
80030 KARAKOY
ISTANBUL - TURKEY

FAX: 90-212-293-7443, or 249-3935
PHONE: 90-212-293-8416, or 243-1539
E-mail: arisy@superonline.com

UNITED KINGDOM

H-SQUARED ELECTRONICS
CONIFER HOUSE
OLD BRIDGE WAY
SHEFFORD, BEDFORDSHIRE
SG17 5HQ ENGLAND

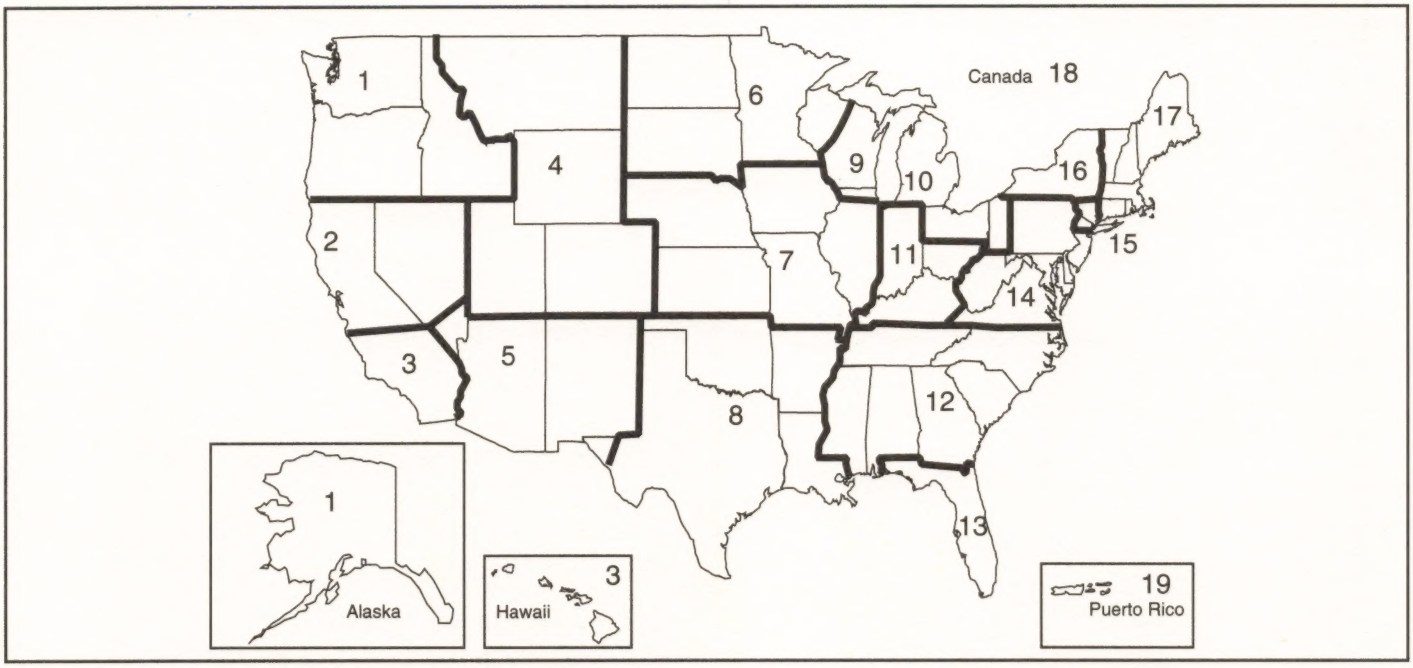
FAX: 441-462-815-187
PHONE: 441-462-815-115 or 462-851-155

VENEZUELA

UNION ANDINA C.A.
AVENIDA 12, NO. 64A-50
MARACAIBO 4001A
VENEZUELA

FAX: 58-61-427242
PHONE: 58-61-433449, or 430757
E-mail: be-o-kay@iamnet.com

Domestic
Manufacturing Representatives



1. Jas. J. Backer
221 West Galer Street
P.O. Box 9327
Seattle, WA 98109
Phone: (206) 285-1300
FAX: (206) 282-2967

10550 S. W. Allen Blvd.
Suite 225
Beaverton, OR 97005
Phone: (503) 627-0168
FAX: (503) 627-0927

2. Ross Marketing Associates
3350 Scott Blvd. Bldg. 51
Santa Clara, CA 95054
Phone: (408) 988-8111
FAX: (408) 492-0197

3. West Electronic Sales Co.
16581 Burke Lane
Huntington Beach, CA 92647
Phone: (714) 375-6500
(310) 493-5569
FAX: (714) 375-6507

9524 Kearny Villa Rd.
Suite 105-C
San Diego, CA 92126
Phone: (619) 566-8430
FAX: (619) 566-8854

4. C.T. Carlberg & Assoc., Inc.
Oxford/Santa Fe Bus. Park
4251 S. Natches Ct., Unit-L
Englewood, CO. 80110
Phone: (303) 762-9200
FAX: (303) 762-9530

5. C.T. Carlberg & Assoc., Inc.
4120 N. Goldwater Blvd.
Scottsdale, AZ 85251
Phone: (602) 970-6788
FAX: (602) 970-8046

4701 Montano Blvd. N. W.
Suite 105
Albuquerque, NM 87120
Phone: (505) 899-2155
FAX: (505) 899-2160

C.T. Carlberg & Assoc., Inc.
1220 Goldenkey Circle Ste. A
El Paso, TX 79925
Phone: (915) 591-8195
FAX: (915) 591-6544

6. Holmgren Associates
6301 Central Ave. N.E.
Minneapolis, MN 55432
Phone: (612)574-9983
FAX: (612)574-9255

7. KKB & Company
1610 S. Big Bend Blvd.
St. Louis, MO 63117
Phone: (314) 647-2400
FAX: (314) 647-3773

104 North 12th
Blue Springs, MO 64015
Phone: (816) 229-0001
FAX: (816) 228-1466

1070 Lyons Ln.
Marion, IA 52302
Phone: (319) 373-1730
FAX: (319) 373-2019

8. Pro-Comp Sales Company
20815 Durand Oak Ct.
Cypress, TX 77429
Phone: (281) 373-0238
FAX: (281) 373-0310

1778 N. Plano Rd.
Suite 120
Richardson, TX 75081
Phone: (214) 669-1500
FAX: (214) 669-1293

1104 South Mays
Suite 204
Roundrock, TX 78664
Phone: (512) 255-4848
FAX: (512) 255-6264

9. The Dombrow Company
2401 W. Hassell Road
Suite 1565
Hoffman Estates, IL 60195
Phone: IL: (708) 885-9922
WI: (414) 263-4116
FAX: (708) 885-9475

10. Electronic Salesmasters, Inc.
24100 Chagrin Blvd.
Beachwood, OH 44122
Phone: (216) 831-9555
FAX: (216) 831-8647

11. D-M Associates
4351 E. 82nd Street, Suite D
Indianapolis, IN 46250
Phone: (317) 842-4424
FAX: (317) 842-4449

12. Mountain Electro Marketing
6025-H Atlantic Blvd.
Norcross, GA 30071
Phone: (404) 448-5594
FAX: (404) 448-8230

Aspen Building
3125 Poplarwood Court
Suite 101
Raleigh, NC 27604
Phone: (919) 876-0704
FAX: (919) 876-0804

190 Lime Quarry Road
Suite 106
Madison, AL 35758
Phone: (205) 772-9038
FAX: (205) 772-9597

13. Aurora-Schmitt Assoc. Inc.
2298 Boca Raton Blvd.
Suite #17
Boca Raton, FL 33431
Phone: (561) 392-9497
FAX: (561) 392-8773

1342 E. Vine St. Ste 103
Kissimmee, FL 34744-3655
Phone: (407) 931-2728
FAX: (407) 931-1261

Aurora-Schmitt Assoc. Inc.
3614 El Camino Ct.
Largo, FL 34641
Phone: (813) 538-4903
FAX: (813) 538-2245

14. DVS Company
9B Princess Road
Lawrenceville, NJ 08648
Phone: (609) 896-1112
FAX: (609) 896-8117

15. Aurora-Schmitt
738 Smithtown Bypass
Smithtown, NY 11787
Phone: (516) 979-1313
FAX: (516) 979-1384

16. Micro-Tech Marketing Inc.
1280 Scottsville Road
Suite 20
Rochester, NY 14624
Phone: (716) 527-8090
FAX: (716) 527-8105

17. Logan Sales
192 Worcester Street
Wellesley, MA 02181
Phone: (781) 235-6868
FAX: (781) 235-5010

18. DCS Electronics Ltd.
85 Chambers Dr. Unit 7
Ajax, Ontario, Canada
L1Z 1E2
Phone: (905) 683-4500
FAX: (905) 683-8074

19. NuTek Sales Inc.
Calle Hucar #38 Bajos
Bo Sabanetas
Mercedita, P.R. 00715
Phone: (787) 844-3840
FAX: (787) 844-3915

MALLORY®

NORTH AMERICAN CAPACITOR COMPANY

http://www.nacc-mallory.com

ISO 9002

North American Capacitor Company
UL REGISTERED FIRM
ISO 9002 A1240

7545 ROCKVILLE ROAD, INDIANAPOLIS, IN 46214
PHONE: 317-273-0090 • FAX: 317-273-2406

Form No. CAT-GEN-98 Printed in USA